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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

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CONFLICTING IDEALS AND THEIR BEARING UPON CHARACTER EDUCATION*

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ONE of the outstanding characteristics of modern educational theory is that it considers the concepts of right and wrong as dynamic rather than static. A principle may be valid under one set of circumstances and meaningless under changed conditions.

There was a time when the teaching of ideals and principles differed little from the teaching of any other subject of instruction. Moral concepts were taught in the same manner as facts of geography or as simple rules of arithmetic. The modern educator will rarely give his ethical instruction in the form of formulae and principles but will base his teaching on life situations. Such situations are usually complex, involving a number of factors and variables. Sometimes the situation is so complex, the problem so multi-dimensional, that no single principle could be followed without infringement upon another principle. Such a situation presents ordinarily a moral conflict.

The purpose of this study.—To describe a series of problems which involve conflicts between such principles as honesty and loyalty, truthfulness and courtesy, etc., and to obtain the opinion of educators as to what is the correct solution in those situations of conflict.

EDUCATORS' OPINION CONCERNING PROBLEMS OF CONFLICT

After a survey of educational literature, 70 conflict problems were constructed. The list of problems was presented by the writer to 517 graduate students in education taking work in 10 classes with the following professors: Benjamin R. Andrews, William C. Bagley, Daniel A. Kulp, William H. Kilpatrick, Paul R. Mort, Paul Lutz, S. R. Powers,

* This paper was presented before Section Q (Education) at the meeting of the American Association for the Advancement of Science in New Orleans, Convocation Week, 1931-1932. This is a preliminary report of an extensive study of problems of conflict.

Sidney L. Pressey, Percival M. Symonds, and Goodwin B. Watson. The writer feels indebted to these professors for their kind coöperation and to Professor Otis W. Caldwell for many valuable suggestions. The problems were composed of two types:

A. Descriptions of situations from child life involving some conflict. For example:

"The grocer came to collect a bill. John was told by his father to tell the grocer that there was no one home.

1. John told the grocer: 'Nobody is home.'
2. John told his father he won't tell a lie.
3. John told the grocer his father was home but has no money.
4. John told the grocer his father was home but told him to say he was away."

The educators were asked which, in their opinion, is the correct solution, under ordinary circumstances.

B. Educational principles. A series of paired educational issues which are to some extent mutually exclusive: e.g. should education lay more emphasis upon being a follower or upon being a leader; upon specialization or upon versatility; upon inhibition or upon self expression.

RESULTS

1. *Concensus of opinion.* One of the major aims of this study was to determine the concensus of opinion among graduate students in education as to what constitutes right and wrong in these problems of conflict. Now, if all educators agreed as to the correct solution to each problem the extent of agreement would have been 100 percent. In reality the extent of agreement was only 60 percent, indicating a great deal of diversity of opinion. The agreement differed for the different problems depending upon the complexity of the conflict, but there was not a single problem concerning which there was 100 percent agreement.

The following is an example of the few items showing high agreement:

"Philip dropped and broke a victrola record that was his father's favorite. He knew his father would feel badly about it.

1. He told his father what had happened.
2. He hid the record and didn't say anything about it.
3. He told his father that he had found the record broken.
4. He told his father he had been looking for that record himself but couldn't find it."

In this problem there was 98 percent agreement that the best answer

is "He told his father what had happened." Apparently the factor of sparing the father's feelings was not considered sufficient reason for withholding the truth.

Here are a few examples of problems showing little agreement. The percentage of "judges" choosing each item as the best solution is given:

1. "John's mother told him to tell a visitor that she was not at home.
   11% 1. John told the visitor "My mother is not home."
   52% 2. John said: "But mother you are home."
   28% 3. John told the visitor that his mother was home but does not feel well.
   9% 4. John said: "My mother is home but she told me to say she is not home."

2. "Milton's mother bought him a book for three dollars and told him to tell his father it cost one dollar. His father asked him later how much his book cost.
   18% 1. Milton told him it cost one dollar.
   42% 2. Milton told him it cost three dollars.
   36% 3. Milton refused to tell.
   4% 4. Milton told him it cost three dollars but that mother had said to tell him it cost one dollar."

3. James was 13 years old. His family was very poor, and needed money badly but there is a law forbidding children under 14 to work in factories. The only place James could make any money was in a factory.
   23% 1. James didn't do anything about helping his family.
   14% 2. James got a job in a factory by lying about his age.
   0% 3. James stole some money and brought it home.
   63%. 4. James persuaded the employer to give him a job in spite of the law.

4. "The conductor was collecting fares on a crowded street car. John held his fare out and said, 'Here,' but the conductor didn't notice him, and was going through to the other end of the car. John had to get off soon, and the conductor wouldn't return. If John pushed through to give him his fare he would have to inconvenience many passengers.
   41% 1. John pushed through the crowd and paid his fare.
   5% 2. John got off without paying his fare and was glad of the free ride.
   9% 3. John gave his fare to the man next to him to pay when the conductor returned.
   45% 4. John got off without paying and paid the following day."

It will be noted that in these problems each one of the possible solutions was chosen by some of the 517 judges as the ideal solution.

A marked difference in extent of agreement was revealed when the 517 judges were classified into five groups according to major interests:

1. Educational Psychology.
2. School Administration.
3. Teachers of special subject matter.
4. Teachers of religious education.
5. Philosophy of education.

The percentages of agreement within each of these five groups were as follows:

1. Philosophy 51%
2. Psychology 56%
3. Religious Education 64%
4. Teachers 69%
5. Administration 73%

It appears that among school administrators and among teachers there is a greater extent of agreement as to what constitutes right and wrong than among psychologists and philosophers.

2. *Sex differences in agreement.* The percentage of agreement was computed separately for the men (211) and women (306). The women showed a slightly greater agreement among themselves as to the correct solutions than the men.

In several problems there were marked sex differences as to which is the correct solution. The following are three examples of such problems:

1. "Mary gave Helen some candy which Helen did not like.
    1. Helen ate the candy without saying anything, in order not to make her friend feel badly.
    2. She ate the candy but told Mary that she didn't like it.
    3. She would not eat the candy and told Mary she didn't like it.
    4. Helen didn't eat the candy, claiming that she had promised her mother not to eat any candy."

In the opinion of the men the best solution was: "She would not eat the candy, and told Mary she didn't like it." (65.3 percent)

In the opinion of women, the best solution was: "Helen ate the candy without saying anything in order not to make her friend feel badly." (62.9 percent)

2. John had a new teacher. He thought she was one of the best teachers he ever had, but for some reason he did not like her. The principal asked him once how he liked his new teacher. John said:

1. The teacher is fine and I like her very much.
2. The teacher is all right, but I don't like her.
3. I don't like her, I guess she is no good.
4. She is one of the best teachers I ever had."

The majority of men considered item 2 the best answer (60 percent), "The teacher is all right, but I don't like her." The majority of women chose item 4 as the best answer (63.8 percent): "She is one of the best teachers I ever had."

3. "When Ben's teacher gave him back his test paper, he found that she made an error in the basis of marking, so that everyone in the class had a mark of 10 points higher than it should have been.

1. He called the teacher's attention to the error and so lowered everyone's mark.
2. He did not say anything about it.
3. He asked the other members of the class what they think ought to be done about it.
4. He told her that his mark was 10 points too high, without saying anything about the others.

Answer number 1 was chosen as the correct solution by 62.8 percent of the men and only by 33.2 percent of the women. The fourth answer was preferred by three times as many women as men, 56.3 percent and 18.6 percent respectively.

In each of the above problems the men have apparently given preference to a frank statement of the truth, while in the opinion of the women consideration of others was given preference over truth-telling.

The tendency on the part of the women to prefer the response in which the truth is either partly or wholly withheld revealed itself frequently. In problem 6 (where the mother tells her boy to give his father a false answer regarding the price of a book) answer number 3, "Milton refused to tell" was preferred among women more frequently than among men (37.9 percent and 25.3 percent respectively).

The tendency of men to prefer the response of truth-telling was evident even in problems where such a statement might be considered brutally frank, as in the following example:

"John met a friend who looked very pale and worn out.

1. He said "You look so pale, are you sick?"
2. He said "My, but you look well," in order to make him feel better.
3. He didn't say anything about his friend's looks.
4. He told his friend that he was sick also.

More men than women favored the response "You look so pale, are you sick?" (10.0 and 6.6 percent).

CONFLICTING PRINCIPLES

The second part of the inquiry was composed of ten "pairs" of ideas, each pair representing a potential conflict. The educators and students were asked to state in each case which of the two ideas should be more emphasized in the process of education. For example, should *self-expression* be more emphasized than *inhibition?;* should preparing for *leadership* be given greater emphasis than preparing for *followership?;* should *caution* be taught to a greater extent than *fearlessness?* Should the idea of compromising with reality be emphasized more than the idea of adhering to an ideal? Should education lay more stress on being progressive than on following tradition?

Each pair of ideas represented either two conflicting educational theories or two ideas in potential conflict.

TABLE I

PREFERENCE AMONG CONFLICTING PRINCIPLES

CONFLICTING IDEAS			Percentage of Preference	
1		2	1	2
Fearlessness	versus	Caution	23%	77%
Inhibition	versus	Self-expression	20	80
Self-sacrifice	versus	Ambition	50	50
Being a follower	versus	Being a leader	22	78
Courtesy	versus	Truthfulness	23	77
Being progressive	versus	Adhering to tradition	91	9
Specialization	versus	Versatility	49	51
Loyalty to country	versus	Respect for human life	12	88
Compromising with reality	versus	Adhering to ideal	54	46
Honesty	versus	Respect for parents	81	19

Table I presents the ten pairs of ideas and for each pair the percentage of the 517 educators.

Table I indicates again that there was no unanimity of opinion concerning any one of the ten pairs of conflicting ideas. In the case of *self-sacrifice versus ambition,* and *specialization versus versatility,* the educators were equally divided among themselves as to which is the most desirable of the two. A slight majority expressed *compromising*

with reality over *adhering to ideal* (54-46). A considerable majority preferred *caution* to *fearlessness* (77-23), being a *leader* to being a *follower* (78-22), and *truthfulness* to *courtesy* (77-23). There was a greater agreement as to the preference of *self-expression* over *inhibition* (80-20), *respect for human life* over *loyalty to country* (88-12), *honesty* over *respect for parents* (81-19), and *being progressive* over *following tradition* (91-9).

SUMMARY

The present study revealed that educators show considerable diversity of opinion among themselves as to what constitutes right and wrong in problems of conflict and the lack of agreement increases with the complexity of the problem. The reasons for the diversity of opinion is chiefly the numerous possible considerations involved in those situations. It is this consideration of *all* factors and circumstances that becomes the criterion for solving conflict problems. The concepts of right and wrong appear to be relative rather than absolute entities, depending upon the persons and the specific conditions involved.

Any form of character education which limits itself to the teaching of ideals in isolation will not only be ineffective but also relatively useless. It leaves the child where he is most in need of help. Which of the principles should he follow, which ideal should be given preference? To leave such solution to the child is not only unwise but also unjust.

The solution to such situations where one is forced to decide which of two conflicting principles shall be followed, or to choose the lesser of two evils constitutes the very essence of character education. The choice between right and wrong is ordinarily a matter of intelligence or information. The choice between right and right is largely dependent upon character. A person's intelligence may be judged from the manner of solving problems, the correctness of which are determined largely by science and mathematics. A person's character may be judged from the manner of solving conflicts, the correctness of which are determined by our social ideals and cultural heritage.

THE RELATIONSHIP BETWEEN HEIGHT AND PHYSIOLOGICAL MATURING

MARY A. LEAL
South Philadelphia High School for Girls

THE purpose of the following study is to determine the relationship between type of maturing and growth in height: Are early maturing children taller than later maturing? The data for it are the same that were studied in "Physiological Maturity in Relation to Certain Characteristics of Boys and Girls."[1] Since there are the three factors, namely, of chronological age, height, and physiological maturing, all of which are at work together as the child grows up, the obvious way of dealing with this problem is to use partial correlation coefficients. There are, however, very decided limits to partial correlation[2] due to:

(a) the large probable errors of the coefficients of the various zero order correlations, resulting in part from the smallness of the number of cases for certain r's. And

(b) the three category distribution for physiological maturity which would require correction for grouping.

Consequently some method was sought which would rule out factors whose influence could be accounted for and so enable one to examine the remaining factors.

Both maturity and height are influenced by chronological age. Since the partial correlations for the different ages would depend upon relatively small numbers, (hence, large probable errors), it was necessary to devise some way to get rid of chronological age without paying the penalty of qualifying results because of paucity of cases. The procedure followed in some form or other throughout this paper is this:

The median height groups were found for each chronological age distribution. Each age distribution was tested with the one next it by the Chi Square test[3] to see whether the distributions were the same. They

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[1] Leal, Mary A. *Physiological Maturity in Relation to Certain Characteristics of Boys and Girls,* University of Pennsylvania, Thesis, Philadelphia, 1929.

[2] Holzinger, Karl J. *Statistical Methods for Students in Education.* (New York: Ginn and Company, 1928), 372 pages.

[3] Pearson, Karl. "On the Probability that Two Independent Distributions of Frequency Are Really Samples from the Same Population." *Biometrika,* VIII, 1911.

did not, as was to be expected. A group of ten year olds is taller on the whole than a group of nine year olds, and although there is much overlapping, the difference between a group of nine year olds and a group of ten year olds is too great to be due to chance.

Next the median groups for the two ages were matched, *i.e.*, one distribution was shifted along the age scale until the median groups fell together so that the advantage of age in height was taken away from the ten year olds. (See figure 2). The two distributions with means placed at the same age—either age—were then examined by the Chi Square test to see whether they were the same. If they were, then the two could be combined giving one larger group that could be used for nine or ten year olds, provided the proper height category was selected for the median group. If the Chi Square test showed the distributions not the same, then it was time to look for the cause of the difference. This test determines the reasonableness or unreasonableness of considering the difference between the two distributions as due to chance. If the test shows that it is not reasonable to consider that the difference is due to chance, then it is necessary to look for some factor that might cause the difference between the curves of the two distributions.

This method of treating the data gave large enough numbers to give small enough probable errors to make results significant statistically.

The data consist of records of chronological age, physiological maturity, and height for 2143 school girls, grades four through twelve. Measurements in height are in inches, and the data was compared with that given in Clark's *Heights and Weights of School Children*,[4] also given in inches, to see whether the girls of this study constitute a representative sample. To make this comparison the means and the sigmas of the distributions were compared with those of Clark's study. At 9 and 10 years of age, the children in this study, judged by the mean height of each group at each age, are taller than are those of Clark's study. These children, however, are selected in ages 9 and 10 since only children from the fourth grade up were included. With this exception, the means and the sigmas of the two groups compare favorably, no differences being significant statistically.

If the means and the sigmas for the different ages are compared, what stands out is the steady increase in height with age and the greater dis-

[4] Clark, T., *et al.* "Heights and Weights of School Children," *Public Health Reports*, Washington: Government Printing Office, May 19, 1922.

TABLE I

GIRLS GROUPED BY CHRONOLOGICAL AGE, HEIGHT, AND PHYSIOLOGICAL MATURITY

C.A.	St.	Height in Inches																								
		44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	Total
9	1		1	4	5	8	11	21	13	6	5	15	5	2	1													97
	2					2			1	3			1					1										8
	3																											105
10	1			1	2	7	15	17	21	22	24	22	16	10	2	2	1											162
	2						1	4	6	7	9	7	4	6	5	5	2												56
	3													1	1													2
																												220
11	1	1		1			7	4	16	16	22	21	13	12	9	5									1			128
	2	1					3	3	8	11	11	29	20	11	20	10	4	3	2	4								140
	3								2	1	2	1	3	2		1		3	3									18
																												286
12	1			1	1		2	1	2	4	2	8	11	8	7	2	2	2					1					51
	2		1						5	1	15	13	16	25	17	23	22	7	7	2	2							156
	3								2		1	2	2	5	6	3	4	7	5	3	4		2					46
																												253
13	1								2		2	2	1	5	1		1	1	1									16
	2							3	2	2	2	5	11	28	18	17	27	24	9	9	8	1	3					169
	3											2	4	9	10	8	25	33	23	20	17	11	5	3	3			173
																												358
14	1											1	4	7	9	8	10	9	8	6	5		2					69
	2									1		2	1	7	6	12	23	38	48	40	31	27	16	6	3	2		263
	3																											332
15	1															3	3	5	2	2		1						16
	2												2	2	3	6	20	28	32	35	39	23	12	6	3	1		212
	3																											228
16	1																			4	1							5
	2											3	1	1	3	4	14	13	26	30	26	27	21	5	4	3	2	183
	3																											188
17	1														1													1
	2													1	3	3	7	12	16	19	25	11	10	6	4	2	1	120
	3																											121
18	1																											
	2															2	2	2	10	9	7	8	4	3	3		2	52
	3																											52
Total	1																											454
	2																											620
	3																											1069

persion of heights during the 11th, 12th, and 13th years than in other years. In Clark's study with its larger numbers, there is a straight increase in sigma up to age 13, and a straight decrease after that age. In general, clothes for 11, 12, and 13 year old girls would have to include a greater variety of sizes than it would be necessary to include at other ages.

There are, in most age groups, girls in different stages of physiological maturity. Three stages are recognized in the present investigation. (Table I) In stage 1, girls are immature and show no signs of maturing. Stage 2 girls show signs of maturing, but have not yet begun to menstruate. Stage 3 girls are mature and have menstruated. The stage for each girl in Table I was determined by a physician. The criteria for determining the stage can be found in the reference to footnote 1.

The means and sigmas for each of these stages of maturity for each age are given in Table II.

TABLE II

MEANS AND STANDARD DEVIATIONS FOR 2143 GIRLS GROUPED ACCORDING TO HEIGHT, CHRONOLOGICAL AGE, PHYSIOLOGICAL MATURITY

	Stage 1			Stage 2			Stage 3		
C.A.	No.	Mean Height	S.D.	No.	Mean Height	S.D.	No.	Mean Height	S.D.
9	97	51.41 ±.28	2.71	8	53.50				
10	162	52.75 ±.20	2.55	56	54.50	2.68	2		
11	128	53.78 ±.23	2.60	140	54.46 ±.25	2.96	18	56.67 ±.85	3.61
12	51	55.31 ±.47	3.32	156	57.04 ±.23	2.83	46	59.09 ±.49	3.31
13	16	56.00 ±.73	2.92	169	58.63 ±.22	2.91	173	60.98 ±.21	2.71
14				69	59.55	2.52	263	61.90 ±.18	2.85
15				16			212	62.25 ±.16	2.34
16				5			183	62.76 ±.20	2.72
17				1			120	62.17	
18							52	63.32	

This table permits the examination of height curves for different stages of maturity. If these means are compared with the means for the whole group it is evident that the means for stage 1 and stage 2 drop

more and more below the mean height for the whole group as chronological age advances. (See Figure 1). In stage 3 the mean height is above that of the group until the later years, when it meets it. In other

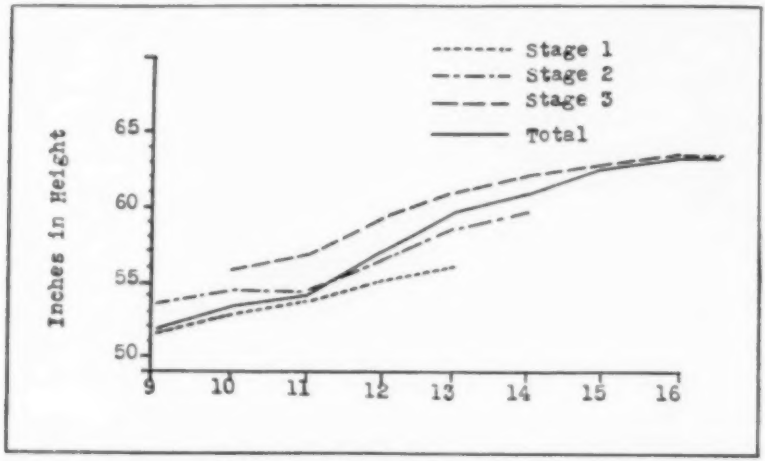

FIGURE 1. MEANS IN HEIGHT AT EACH AGE FOR EACH STAGE OF MATURITY

words, the later maturing children as a group are shorter than the earlier maturing at any particular age. This does not seem in harmony with the findings of Van Dyke, whose late maturing girls were slightly taller than the others.[5]

Children grow taller each year and the earlier maturing are taller than the later (two factors affecting the height curve). We know the effect of these two factors. If we match the median height groups to counteract this effect, we can then see by means of the Chi Square test whether there is any other factor at work in increasing the height of the children. The results of matching the median height groups for all ages in each of the three stages are given in Table III.

Table III reads: The probability of securing by mere chance two distributions differing as much or more than these is about 50:50 for CA 11 and CA 12 (P = .58) Stage 1. The probability of securing Stage 1 and Stage 2 differing as much or more than these at 11 CA is also about 50:50 (P = .53), *i.e.*, you'd get as *bad* a fit 53 percent of the time.

Stage 1 with the exception of ages 9 and 10, which are selected, is of

[5] Van Dyke, G. E. "The Effect of the Advent of Puberty on the Growth in Height and Weight of Girls." *The School Review*, XXXVIII (March 1930), pp. 211-221.

TABLE III

VALUES OF P FOR CHI SQUARE TEST FOR HEIGHTS AT SUCCESSIVE CA'S, MEDIAN HEIGHT GROUPS MATCHED

CA	No.	Stage 1 Bet. St. 1 & 2	No.	Stage 2 Bet. St. 2 & 3	No.	Stage 3 Bet. St. 3 & 1
9	97		8			
Bet. CA 9 & 10	P = .01		P = .18			
10	162	P = .61	56		2	
Bet. CA 10 & 11	P = .12		P = .10			
11	128	P = .53	140	P = .00	18	P = .00
Bet. CA 11 & 12	P = .58		P = .77		P = .22	
12	51	P = .36	156	P = .24	46	P = .6
Bet. CA 12 & 13	P = .6		P = .24		P = .06	
13	16	P = .3	169	P = .2	173	P = .5
Bet. CA 13 & 14			P = .56		P = .03	
14			69	P = .6	263	
Bet. CA 14 & 15			P = .37		P = .00	
15			16	P = .8	212	
Bet. CA 15 & 16					P = .13	
16			5		183	
Bet. CA 16 & 17					P = .41	
17			1		120	
Bet. CA 17 & 18					P = .73	
18+					52	

the same type of distribution. Stage 2 from 11 years on is the same. Stage 3, however, shifts its type of curve. It is possible that in stage 3 there is a more heterogeneous collection of early and late maturing children. The shift comes at 14 and 15. What causes it might be the influence of later maturing children, 15 years old, who, on the whole, would be shorter children, thus skewing the 15 year old curve positively and the 14 year old curve negatively. Figure 2 illustrates this.

This difference between the curves for C.A. 14 and C.A. 15 is significant statistically. The younger group may contain more girls who are early maturing and hence taller.

Tables II and III also give the relations between the distributions for the different stages of maturity in any age. What is determined from this is whether or not, if we cut out the increase in height due to earlier maturing, the distributions are of the same general type. If ages 11, 12, 13, the only ages at which the three stages are represented at all, are examined, the differences between the means of the stages are significant except at 11. (Table II). In order to increase the numbers and so decrease the probable error, means were matched to that of 11 years for each of the three stages. Means and probable errors were then computed for each stage. The differences in height between stages under these conditions were significant.

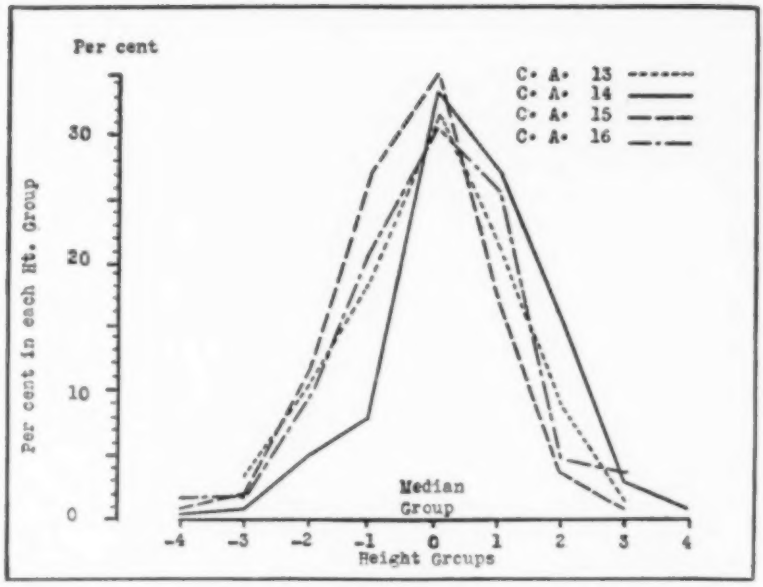

FIGURE 2. DISTRIBUTIONS OF STAGE 3 GIRLS, 13, 14, 15, AND 16 YEARS OLD, SHOWING SKEW IN HEIGHT CURVES

	MEDIAN HEIGHT GROUP								
	—4	—3	—2	—1	0	1	2	3	4
CA 13		03	11	19	32	21	09	03	
CA 14	003	01	05	13	33	27	16	03	01
CA 15	01	02	12	28	35	17	04	004	
CA 16	02	02	10	21	31	26	05	03	

This Table reads: At 13 CA, 32 percent of the girls are in the median height group; 21 percent are in the next taller group, etc.

	μ_3	μ_4	
CA 13	—.415	148.123	
CA 14	—3.18	181.18	$\sigma CA_{14} = 2.85 \pm .12$
CA 15	—2.27	99.35	$\sigma CA_{15} = 2.34 \pm .11$
CA 16	—18.33	378.53	Difference: $.51 \pm .16$

NOTE: CA 13, fairly regular
CA 14, more taller girls near the mean; sharp drop in percent of shorter girls. These girls were probably fairly tall before the change to Stage 3 came—perhaps early maturing.
CA 15, more shorter girls near the mean; sharp drop in percent of taller girls. More later maturing girls have changed to Stage 3 by this time.

TABLE IV

MEANS AND STANDARD DEVIATIONS IN HEIGHT FOR EACH STAGE, MEDIAN GROUPS MATCHED AT 11 YEARS. GIRLS, 2143

Stage	Mean		
1	$53.2511 \pm .13$	2.74	$M_1 - M_2 = 1.65 \pm .17$
2	$54.9032 \pm .11$	2.75	$M_1 - M_3 = 2.12 \pm .13$
3	$57.0262 \pm .08$	2.68	Both significant

All distributions with means in height matched for all ages were then combined for each stage and the Chi Square test applied with means matched for stage.

TABLE V

VALUES OF P FOR CHI SQUARE TEST FOR STAGES, MEDIAN GROUPS MATCHED FOR HEIGHT AT 11. GIRLS 2143

Stage	No.	Value of P	
1	454		
		.5	Between Stage 1 and 2
2	620		
		.6	Between Stage 2 and 3
3	1069		

This table reads: Such a pair of distributions as occurs here for stages 1 and 2, or a worse fitting pair, would occur by chance 50 percent of the time.

This showed that in general the three stages follow the same type of curve, *i.e.*, that the effect of earlier or later maturing is merely to shift the distribution bodily along the height scale.

In order to secure large enough numbers to determine the type of curve followed by the height distribution, all means for height were matched both for age and for stage. This had the effect of getting rid of the known increase due to both of these factors. Since the curves, except for stage 3, are the same, and since for stage 3 the shifts at 14 and 15 years of age practically offset each other, the matching would not alter the type of curve, and would give numbers large enough to be significant in the face of their probable errors.

The four moments obtained for this new distribution and the criteria for determining the type of curve according to Pearson's classification label the curve Type IV.

Pearson fitted a distribution of 2192 eight year old girls to Type IV.[6] Eight year old girls would be largely homogeneous as to stage. Hence this distribution would correspond to that used in this paper after this group had been made homogeneous in stage and age by the matching of means.

This use of the Chi Square test to determine homogeneity carries with it certain limitations:

1. If this test shows, by a large value of P, that the two distributions are homogeneous, it is to be remembered that they are homogeneous only

[6] Pearson, Karl. "Type IV Frequency Curve Fitted to the Stature of 2192 St. Louis School Girls, Aged 8," *Philosophical Transactions of the Royal Society of London*, Series A, pp. 186, 387.

TABLE VI

CRITERIA FOR DETERMINING THE TYPE CURVE FOR HEIGHT, MEDIAN GROUPS MATCHED FOR CHRONOLOGICAL AGE AND PHYSIOLOGICAL MATURITY

Height Group[1]	Distribution No.		Criteria	
7	1		Mean	.0756 + S
6			σ	2.762
5	1		μ_3	7.6303
4	7		μ_3	—1.7649
3	56		μ_4	203.6429
2	229			
1	481		B_1	007
0	657[2]			
—1	444		B_2	3.498
—2	201			
—3	47		K	006
—4	17			
—5	1			
—6	1			
	2143			

[1] = Distances from median group. Group width 2 inches.
[2] = Median group: Adjust this frequency to the median height group, S for any age at any stage. See Table I.

for the same or for coarser groupings. Finer grouping might easily lower the agreement between the two.[7]

2. A probable error for Chi Square would place conclusions as to homogeneity, if not on a sounder basis, at least on a more refined basis. The probable error for Chi Square has not been worked out, however, and where the Chi Square test has been used, the value of P has been based on the value of a definite Chi Square. It is for this reason, perhaps, that

3. Goodness of fit is judged by the general size of P and not by small differences between the P for one and the P for another set of distributions.[8] According to Holzinger,[9] the value of P should be .2 or more for the fit to be regarded as good. Rietz[10] considers .1 (once in ten times) not a bad fit, but objects to assigning arbitrarily some special value to P, this value to be considered the border line between fitting and not fitting.

The Chi Square test, however, in this st' 'y, has shown itself at cer-

[7] Rietz, H. L. (*Editor*) *Handbook of Mathematical Statistics.* (Cambridge: The Riverside Press, 1924), p. 180.
[8] *Ibid.*
[9] Holzinger, Karl J. *Op. cit.*, p. 247.
[10] Rietz, H. L. *Op. cit.*, p. 80.

tain ages (ages 9 and 10, for instance) more sensitive to differences in homogeneity than has the mere comparison of means and sigmas; for this reason it seems worth while to go through the computations involved in securing its judgment as to the homogeneity of samples drawn from different sources.

CONCLUSIONS

1. Mean height increases with chronological age, greatest variability being in ages 11, 12, 13.
2. Earlier maturing girls are taller than later maturing of the same age.
3. Stage 3, mature, girls at different ages are not homogeneous in distribution according to height, due probably to the predominance of different types of maturing in different ages.
4. Type of maturing shifts the mean height of a group, but in general does not alter the type of the curve.
5. The height curve is a type IV curve.

DETAILED ANALYSIS OF THE TASK OF LEARNING TO READ LATIN*

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1. PURPOSE OF THE STUDY OR END TO BE ATTAINED

IT has been said that a student can and should learn to read Latin just as he has learned to read his mother tongue. In English we begin with the simplest words and sentences, advancing slowly step by step during the successive years. Furthermore the student can learn to read Latin just as Roman boys and girls did. They read each phrase as they came to it. Changing the order of Latin sentences often changes the meaning. There is no sentence in correct Latin that will not give up its meaning if its words and phrases are taken in order one at a time as they are found in the text.

Then, too, a student can learn to read Latin by reading more Latin and evaluating what he reads, but that can be done only if the reading grows harder gradually and if the text contains material of such interest that he is eager to read more. And, lastly, a student can learn to read Latin only if he prepares each day's work thoroughly, not as an end in itself but as a help toward the final mastery of that language from which two-thirds of the words in the English language are derived. The Roman poet Vergil said many many hundreds of years ago "possunt quia posse videntur" (they can because they believe they can).[1] This belief in one's ability to succeed is a wonderful incentive toward learning of all kinds.

But belief in success, perseverance, and even thorough application, will not in themselves bring the student to his goal. There are certain definite things which learners of every subject must do in order to master that subject. This is particularly true of learning to read Latin. Learning to read Latin with ease and pleasure presents certain problems to every learner of which not only the learner himself should be cognizant, but also he or she who attempts to direct the learning process involved.

It is the purpose of this study to determine what these problems are, and to ascertain other facts about the learning process involved that would enable teachers of Latin to be more helpful to those who must solve these problems as the learning proceeds. Both teacher and learner should know these problems in order to be able to determine how and when each

* Submitted in partial fulfillment for degree of Master of Arts in Psychology, Indiana University.

[1] Magoffin, R. V. D. *Introduction to First Year Latin.* (Newark: Silver, Burdette & Co.), p. 14 ff.

necessary thing could best be done; to learn how to avoid or cope with the many difficulties which attend the successful performance of each of these necessary tasks; to be able to measure the progress which learners are making in performing each one of these necessary tasks, and to test the value of the method of instruction used to help each learner solve the various problems encountered in the learning.

2. WHAT ALL LEARNERS OF THE SUBJECT HAVE TO DO

By making an analysis of the learner's task we may divide it into three major problems, each of which will of course have many sub-problems or divisions:

First: The learner must master the standard language symbols or words of the Latin language and be able to comprehend what they stand for in all their forms and uses.

Second: He must learn to take in the thought of each word group as it appears.

Third: He must learn to evaluate and to use what he has read in Latin in his future reading or study of this language.

STAGE 1.

In mastering the standardized language symbols and words of the Latin language the learner must first develop an initial stock of Latin words. This may be accomplished more easily and quickly if the following points are observed:

1. By a study of derivatives.
   a. From the Latin—being able to identify the roots, prefixes, and suffixes of Latin words when found in English words.
   b. From English—being able to identify the Latin ancestors of English words.
2. By practicing and improving the following types of perception.
   a. *Visual*—the student must be able to recognize Latin words upon sight, noting word forms, endings, uses in sentences and word groups.
   b. *Auditory*—student must be able to recognize these words when they are pronounced by himself or by the instructor, paying particular attention to quantity and sound.
   c. *Motor*—student must be able to write these words—using them intelligently in sentences that will illustrate grammatical principles.
3. By giving special emphasis to form endings and uses of words.

Practicing these forms and case endings until they become tools for use in the learner's work.

4. By using some sort of scheme (card index, etc.) for learning vocabulary.

STAGE 2

In learning to take in the thought of each word group as it appears the following things must be done:

1. The student must learn to realize the purely relative importance of grammar.
2. The student must learn that language is made up of small speech units or word groups, which represent thoughts; that grammar and syntax are merely aids which the author has employed to express these thoughts. The most important aids to the mastery of this problem are the following:
   a. Learning to observe key words in sentences and key sentences in paragraphs.
   b. Improving his ability to understand word groups and sentences of many types and by becoming more familiar with the more complicated Latin language-units.
   c. Learning to avoid *literal* translations and grasping the thought, as expressed in Latin.
   d. Increasing the ability to write Latin sentences which illustrate the grammatical principles involved in the text.

STAGE 3

In learning to evaluate and use what he has read, the following things must be done by the learner and are suggested as aids for teachers who are assisting him in solving this problem.

1. He must learn to appreciate the literary qualities of the Latin authors read.
2. He must develop from his reading a taste for supplementary reading so as to include more information on Roman history and the daily life of the Roman people.
3. He must note and cultivate the ability to see the relation of Latin to English, noting especially the contribution which the study of Latin may make to a knowledge of English derivatives and of the principles of English grammar.

3. TYPE OF LEARNING INVOLVED IN MASTERING A NEW LANGUAGE

Every case of learning is built upon some native or previously learned responses which a learner can make. Every form of skill that an animal

or man acquires is developed by changing, combining or extending his native and previously learned responses into new modes of reaction. Such linkages between old modes of reaction and new stimuli are established by means of what psychologists call "conditioning stimuli" and the principle of associative shifting. Together they produce what is technically called a conditioned response. In all such modifications of behavior a new stimulus comes to act as a successful stimulus for eliciting the original response.

Learning to read Latin or to read any foreign language is, fundamentally, an example of making this kind of modification. That is to say, it is a case of perceptual learning of the "conditioned reflex" type. The meanings which the words represent must be linked to a different stimulus (in this case the Latin word) from the one (the English word or appropriate object or event) which formerly aroused this particular meaning response. When a student has learned to read Latin easily, the *Latin* words will arouse for him the proper meaning responses as readily as did the English words to which these meanings were formerly linked. A detailed explanation of how a Latin (or other foreign word) comes to be substituted for the English word which formerly aroused a particular meaning response will help make this general statement clear.

Any normal individual during the years of his life acquires a rich fund of meaningful experiences through his reactions to the various phases of the physical and social environment in which he lives. As a child, he begins to understand the spoken words of his native language which stand for certain definite parts of his experience, as "hot," "sharp," "fall," "red," "mother," etc. Later the child learns to use these words as stimuli to call up certain phases of experiences which he has had. For example, when the child is playing with his dog the mother or other members of the family regularly utter the word "dog" when that animal comes in range of the child's vision. The sight of the dog together with, perhaps, the smell, feel, and the sound of the word dog cause some sort of a functional linkage to be established in the child's mind between the spoken word and the dog itself. After a number of repetitions the *spoken word* "dog" will call up the same meaning response in the child's mind as does the animal itself. The learning process involved may be roughly illustrated by the diagram given in Figure 1.

As the diagram shows, with practice the spoken word "dog" soon comes to act as a successful stimulus for arousing the correct *meaning*

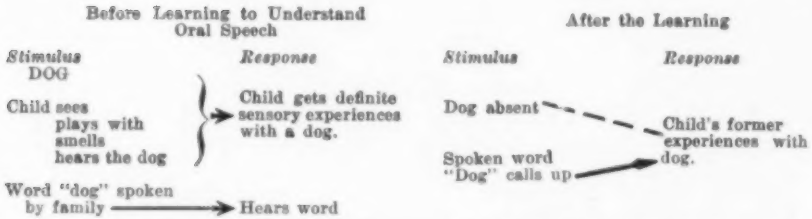

FIGURE 1. SHOWING HOW AN APPROPRIATE MEANING RESPONSE COMES TO BE DEFINITELY LINKED TO A PARTICULAR STIMULUS-SITUATION WHEN IT HAS BEEN OFTEN ENOUGH ASSOCIATED WITH A STIMULUS THAT AROUSES THE DESIRED RESPONSE

response and may in the future be substituted for the child's former experiences with the dog. It will, in fact, arouse more or less completely all that the actual dog has meant to the child. However, this new word stimulus must be closely associated with the dog or things it represents to make the recognition and interpretation of the word certain and secure.

A great deal of learning takes place in this way. Going a step further with our illustration we may assume that the same child—now having had, say, 12 or 14 years of experience with substituting the English word "dog" for his experiences with the animal itself and having learned to read, write, and understand the English language—now wishes to take up the *study of Latin*. He now again meets the word "dog." This time it is presented together with another stimulus; viz., the Latin word "canis." Again we wish to call up in the child's (now the Latin student's) mind the experience he has had with a dog. How the Latin word comes to suggest to a learner the true meaning of the word may be illustrated by the following diagram:

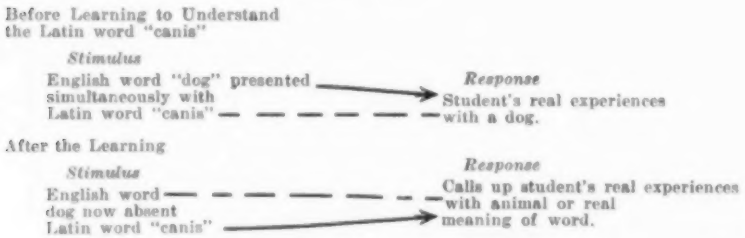
Before Learning to Understand the Latin word "canis"
Stimulus
English word "dog" presented simultaneously with Latin word "canis"
Response
Student's real experiences with a dog.
After the Learning
Stimulus
English word dog now absent
Latin word "canis"
Response
Calls up student's real experiences with animal or real meaning of word.

FIGURE 2. ILLUSTRATES HOW A LATIN WORD COMES TO SUGGEST TO A LEARNER THE REAL EXPERIENCES OR MEANING FOR WHICH IT STANDS

As the diagram shows, after much practice the Latin symbol comes to represent to the learner and to call up in his mind the exact experiences

for which it stands. After the learning has taken place the Latin word "canis" will call up in the student's mind the true meaning of the word without the aid of the English word. A great number of repetitions may, of course, be necessary to attach this correct meaning response to the Latin words. The problem involved is to have the Latin symbol suggest more and more quickly and surely the exact meaning for which it stands. This can only be accomplished in the manner already described.

4. CONDITIONS UNDER WHICH THIS CONDITIONING TYPE OF LEARNING TAKES PLACE

While there are definite physiological and psychological conditions that affect the formation of these conditioned responses as has been proven by experiments conducted upon both the lower animals and human beings by such men as Pavlov, Krasnogorski, Anrep, Twitmeyer, Watson, etc., the only essential features seem to be the ability on the part of the learners to take proper note of the conditioning stimulus (the Latin words) and its regular association with a stimulus or group of stimuli which are capable of arousing the desired response. Enough repetitions of this desired performance must, of course, be made to form a definite linkage between this conditioning stimulus and the desired response. Furthermore, it has been shown that *any* response which an animal or human being can make may become attached to *any* stimulus situation to which the animal can attend. Experiments also have shown that the best results for this type of learning are obtained if the conditioning or secondary stimulus is presented *simultaneously with* the effective or unconditioned one.

The simultaneous stimulation of more than one sense organ will also greatly assist learning of the conditioned-response type. Thus, if a Latin word is seen, heard, pronounced, and written, it will be learned more quickly and easily. For, as stated above, when some new nerve pattern is being formed, the impulses from all of the sense organs are probably drained into the outgoing motor pathway that is active at the time. Facilitation, attention, right attitude, the law of effect, environmental conditions, all have an effect in learning of this type.

STAGE 1. HOW LATIN WORDS MAY BEST BE LEARNED AND A LATIN VOCABULARY ACQUIRED

As already suggested, the ability of a pupil to get correct meanings from a printed page is dependent upon his previous experience, his mental maturity and strength, and upon his power to think. This makes

it imperative that the materials used for practice in learning to read Latin be well adapted to the learner's experience, mental capacity, interest, and intellectual need. The first step in learning to read Latin, therefore, is to *select* materials of such a nature that they can be properly interpreted and understood by the learner.

But in order to master the standardized language symbols or words of the Latin language the learner must first of all develop an *initial stock* of Latin words. This may best be done (1) by learning English derivatives, and (2) by improving the learner's powers of visual and auditory perception. About two-thirds of the words of the English language are derived from the Latin. We cannot, therefore, understand the full meaning of most English words unless we know Latin. Conversely, in beginning the study of Latin our knowledge of some English words may prove particularly helpful for guessing the correct meaning of the Latin words. Thus the two seem almost inseparable. We therefore see the great value of a student trying to find as many derivatives as possible from each Latin root.

A. Improving the Learner's Visual Perception.—In learning a language other than one's mother tongue, it is first necessary to learn some words of that language and their meanings.

To the beginner of Latin, all written or spoken words represent a meaningless jumble until they come to represent certain reactions previously made by him to his environment. He must, from the beginning, link up these Latin words with actual experiences which he has had. The best and quickest way of doing this is, of course, to associate the Latin word with the English word that represents the actual object or experience. To refer again to our former illustration, by linking the Latin word "canis" with the English word "dog," the Latin word alone will, in time, act as a successful stimulus for recalling the student's actual experiences with a dog. When he sees the word "canis" he will not think of the English word "dog" and then of the dog itself, but will short cut the process and immediately think of the *animal* without the help of the English word.

During the entire process of learning to read Latin one of the big problems is, therefore, to establish direct connections between the *Latin words* or *expressions* and the meaning which they represent. One should, therefore, learn to treat the sound or sight of the Latin word and its meaning as one inseparable unit, for to learn to read Latin one must be able to interpret and use the Latin words without using English words

as mediators. The Latin word or word-group must not call up in the student's mind the corresponding English word or word-group, but the *idea* which it represents. The fact that Latin words, by reason of their changes of form, position, function, etc., also change their meanings, really makes it impossible for the student to replace with English words the words of a Latin group. The English equivalents should therefore be abandoned as a link in the learning as soon as possible.

As the student begins his study of Latin, he should associate the Latin words with familiar English words related in spelling and meaning. This is valuable since we can only learn new things by linking them to things that are old or familiar. A good way to do this is to have two lists, one Latin and one English (related of course in meaning and spelling). The teacher may first cover the English meanings and see if the pupil can give them while looking at the Latin. Then reverse the process.

By this method we have the original stimulus, English word, and the conditioned stimulus (Latin word) acting together and the combined energy from the two drained into the desired motor system.

B. Improving the Learner's Auditory Perception.—Sound is a basic element in language. It follows that the student should master the foreign sound system as soon as possible. The nature of a sound depends upon the position of the vocal organs, which are the lips, the teeth, the tongue, and the palate. The definite position which these organs hold in relation to each other is called a constellation. The student of Latin must realize that there is a definite constellation of the vocal organs for each sound in Latin. The Latin vowels, for instance, differ in quality, quantity, and sound. Those uttered in the back of the mouth,—a, o, and u,—are called *open* vowels; those uttered in the front of the mouth,—e, i,—are called *close* vowels. The quality, or open and closeness, refers to the organs of pronunciation.

Quantity refers to the time taken in pronunciation. Vowels are said to be long or short. Twice the time should be taken for pronouncing a long vowel as for a short one.

Oral reading in Latin, however, is employed only as an aid toward silent reading. It must be used only as a successful substitute stimulus for arousing the appropriate meaning response for the printed words. By speaking, or hearing the word spoken, additional sense organs are, of course, brought into action, the impetus from which is in some manner drained into this acting nerve impulse. When enough repetitions have been made of this combination of stimuli, the printed word can be

correctly recognized and interpreted because it has been substituted for the sound of the word, by the principle of "conditioning" already explained.

C. Improving the Learning by Making Motor Responses.—Words written by students are more rapidly learned than words seen or heard. In fact, studies in experimental psychology have proven that a perception is fixed more quickly if it is possible to stimulate all sense organs that are capable of being involved in forming the pattern, since all impulses received from such sense organs are probably drained into the outgoing motor pathway.

Following this suggestion we can see the advantage for a student to write Latin words and word groups from the very beginning of his study. The student should not, however, write Latin exercises and words as an end in themselves, but only as an aid toward the fixing of these new language responses.

D. Practicing Each of the Above Types of Perception and the Proper Reaction.—This means that the student should practice reading, writing, speaking, and listening to Latin as a means to one common end. The time spent in learning new words, model sentences, rules, etc., is wasted unless frequent repetition follows the initial learning. In fact, practice is the only means of developing ability to read Latin with ease and pleasure. We must learn to read by reading. The student himself should be the judge of review work. He should know wherein he is weak and with the aid of his teacher devise means for strengthening the weak phases of his work.

E. Giving Special Emphasis to Forms, Endings, etc.—(1) Mastery of leading grammatical facts is essential and more important than vague knowledge of many details. Verb declensions, and sentence structures are essential.

(2) A student should learn grammatical facts by learning model sentences or phrases which contain these facts. He then can derive a rule at will and in his own way without the wording of a grammarian.

(3) A student should also have several examples for every rule. A rule without illustrations is worthless. He should make his own examples aside from those given by the instructor.

(4) When conjugating verbs or learning declensions instead of learning and reciting detached *paradigms*, the student should form meaningful sentences with each form.

(5) If the student would formulate a few questions on theoretical

parts of grammar and answer these same questions, this exercise would tend to fit these theories in the student's mind.

(6) Lastly, the student should realize that all grammar is a means toward an end and not an end in itself. It tends to simplify the wealth of forms by classification.

F. Linking the Proper Meaning to Words Whenever Heard or Seen. —At the beginning of Latin study the student should be very particular about learning his vocabulary lists thoroughly in order that he may have to rely upon the dictionary or such aids as little as possible. He should read if possible a great deal of material, the content of which is quite familiar. This will give him more opportunity for observing the words and their forms than when he must be concerned about plot and story. He may build up his vocabulary by: (1) answering and asking questions; (2) reproducing the gist of passages; (3) the use of note book for compiling vocabulary lists; (4) underlining new words or writing them in colored ink.

STAGE 2. LEARNING TO TAKE IN THE THOUGHT OF EACH WORD GROUP AS IT APPEARS

1. Efficient reading in Latin, however, involves much more than the mere recognition and correct interpretation of individual words. In fact, the correct recognition of words is only an element in the type of perception that takes place when a reader is getting the thought from a printed page. Learning to perceive the Latin words correctly means acquiring the ability to get accurately and quickly the meaning which a particular arrangement of words presents.

2. Greater familiarity with words and greater familiarity with language forms will assist students in developing these higher-order reading habits.

3. Special drill in the recognition of various sentence forms and practice on the more fundamental grammatical constructions used in sentences will aid pupils in recognizing and interpreting more rapidly and correctly.

4. Emphasis on *key words* in sentences, and as the reading progresses, on *key sentences* in a paragraph will also help the development of correct perceptual habits.

5. The student should study the text, observe the grammatical principles involved, but he must not expect too much logic in grammar, says Dr. Hagboldt. Every language contains many inconsistencies. Language

is not made according to definitely set rules of logic. It is an historical growth, and most often usage and not logic determines grammar.

6. Students should therefore cultivate ability to understand Latin *as Latin*—taking in the thought of each word as it appears.

7. Pupils should grasp the meaning of the entire sentence in the Latin order before attempting any translation.

8. When translation is required, learners should avoid translating Latin words into English, word for word. Nothing is more deadly. When translation is required it must be a recasting of thought from one language to another. It should be a re-creation, a formulation of a phrase or sentence anew, replacing idiom for idiom and thought group for thought group.

9. Theoretical parts of grammar may be retained more easily if the student will formulate and answer in his own wording a few questions on the point involved.

10. Reading will facilitate the study of grammar. After finding certain forms a number of times the student will want an explanation. His curiosity will be aroused and its satisfaction will facilitate retention.

11. Therefore to learn to read Latin, read more Latin.

STAGE 3. LEARNING TO EVALUATE AND USE THE CONTENT OF THE LATIN READ IN HIS FUTURE READING AND STUDY

1. No one has really learned to read correctly in any language who does not apply to his own problems and work the thoughts which he has acquired from his reading. Real reading means striving to understand; it means finding the very essence of the paragraph or of the series of paragraphs read. It means reflecting on the meaning which the author has conveyed and estimating the relative value of the various thoughts which he has presented. It means planning to put these facts to use in solving some of the learner's own personal problems, or in enjoying what he reads.

2. If the material used for Latin reading be suited to a student's interests, needs, physical capacities, and ability to succeed, the student will enjoy the reading. The content of such material will be attractive and of such a character that it will develop a progressive power to read Latin. Interesting tales of adventure, traditions, glimpses of historical lives and figures, thrill students of every land. Students are quick to develop the habit of discovering identical elements in different situations and experiences and of making and applying comparisons.

3. Increased knowledge of facts relating to the type, history, institu-

tions, mythology, and religion of the Romans will undoubtedly bring to a student an increased appreciation of the influence of their civilization on the course of Western civilization.

4. Likewise a broader understanding of their social and political problems will assist in giving him a broader understanding of those same problems as found in our civilization to-day.

5. The allusions to mythology, tradition, and history of the Greeks and Romans with which the literature of every nation is replete will be clear to a student of Latin.

6. As the reading of Latin progresses and a student becomes familiar with the beauties of Latin poetry and the dignity, polish and conciseness exhibited by writers of Latin prose, he will gain a greater appreciation of the elements of literary technique.

7. The literary qualities of his own written English will improve, a knowledge of the simpler principles of language structure will dawn upon him and he will no doubt develop a capacity for appreciation of such qualities in the literature of his own and other languages.

5. SOME SPECIAL DIFFICULTIES ENCOUNTERED WHILE LEARNING TO READ LATIN

All learning or performance curves that have been plotted for complicated forms of learning show in the early part of the learning a rapid and continuous rise due to the fact that the learners are making improvement along many different lines at once. Later, one or more plateaus or periods of arrest in progress are usually found. If the learning is continued, and if the learner does not become discouraged

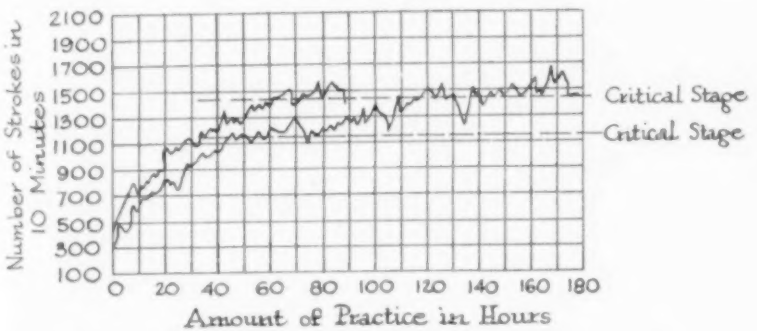

FIGURE 3. IMPROVEMENT MADE IN LEARNING TO TYPEWRITE
(Book, W. F. *Learning to Typewrite.* New York: Gregg Publishing Co., 1925.)

and disheartened, these plateaus in turn are regularly followed by rapid gains in progress so that a typical learning curve looks something like the curve shown in Figure 3.

Moreover, the progress made is never steadily continuous, but moves forward more or less by leaps and bounds, depending upon the stage of advancement and upon the source from which the improvement comes. The fluctuations in performance ability from day to day are due to various objective, physiological, and psychological factors which affect the learner's ability to make the required responses. The long periods of non-improvement are generally caused by difficulties which the task of learning naturally presents. The factors which produce these variations in the learning curve, therefore, deserve special consideration since they operate either to aid or retard the progress which a learner is able to make in doing the things that must be done to increase his skill. We should therefore briefly examine some of the difficulties which arise in learning to read Latin.

(1) Many students do not seem to be able to learn the relative importance of grammar. They find it impossible to read and understand a single sentence without a detailed analysis of all forms, constructions, and rules in the sentence. They forget the beginning of a sentence by the time they reach its end. They forget that a sentence contains a thought. For such students an amount of rapid reading for thought alone is to be recommended.

(2) Other students treat grammar in too relative a manner. They fail to note verb forms, noun endings, position of words, etc. For these students some analytical reading must be prescribed. Either of these methods of reading practised alone in a class cannot be successful. Both ways combined are extremely effective.

(3) Another great hindrance for many Latin students is timidity. They fear to make mistakes. However, we can only learn to do by doing. The student should learn to profit by mistakes. He should make it a rule never to make the same mistake twice.

(4) Other students find their native tongue an obstacle in learning Latin. They fall into the bad habit of translating literally and try to find English equivalents for *each* Latin syllable and word. Such students should avoid translation as much as possible.

(5) Sometimes students are trying to pursue two foreign language courses at the same time. This is a great mistake—it violates all psycho-

logical laws and can only result in confusion. Students and teachers should realize this fact in planning their work.

(6) Another difficulty that often helps retard a learner's progress in Latin is his attitude. He either believes or has been told that Latin is a dead language and of no practical value,—therefore, why study it? In cases of this kind, only a change of attitude can help the learner. It is, therefore, up to the ingenuity of the teacher to find some interest which the student already possesses and link this same interest to the study of Latin,—as for instance, showing a boy interested in becoming a physician, a lawyer, or a scientist, how many Latin words and phrases are used in these professions.

(7) Other wrong attitudes are equally detrimental. Lack of interest or perseverance, laziness, etc., must all be reckoned with. The student of Latin must be made to realize that the subject means hard work and that there is no short cut method or royal road to its mastery.

(8) Other difficulties encountered by individual students together with conditions favorable for work, how to develop an interest in the subject of Latin, etc., will be discussed in Section 7 entitled "The Role of the Teacher."

6. WHY A LEARNER'S PROGRESS IN EACH ESSENTIAL TASK SHOULD BE MEASURED

In our analysis of learning to read Latin we have endeavored to set forth the actual things that must be done by any learner in order to succeed in mastering this task. Now in all fairness to both learners and instructors we should attempt to measure the amount of improvement that is being made in performing each one of these necessary tasks. Unfortunately, the educational or achievement tests that are in general use to-day do not enable teachers to make this type of measurement.

The most helpful method of measurement that could be devised for use by those who are directing students of Latin would be a test that would measure the progress which the learners are making in dealing with each problem that the task of learning to read Latin presents. For instance, the teacher should be able to obtain reliable *quantitative* information about the amount of progress which his students are making in such phases of the work as English derivatives, use of word forms, interpretations of word groups, etc.

The results obtained from the use of such learning tests would serve the following specific purposes:

(1) They would reveal the true causes of the learner's successes or failures, as the case might be, and so indicate what should be done to make the learning more rapid and efficient.

(2) They would be of special benefit to the teacher in identifying the true sources of the learner's gains.

(3) They would enable the learners to become more pleased with their correct and necessary responses and more genuinely annoyed by the reactions made that do not get them ahead.

(4) Such measurements would also increase the students' interest in their improvement and enable them to see better when and why they were making these gains.

(5) They would aid both teachers and students in noting any short cuts in method that might assist them in attaining their goal—since these could be more quickly identified.

It is highly desirable that both teacher and learner should know exactly what must be done to reach their goal and to be able to measure or check themselves in regard to the exact degree of success that is being attained.

7. ROLE OF THE TEACHER IN MAKING THE LEARNING OF LATIN ECONOMICAL AND MOST EFFICIENT

Learning consists in making new responses to stimuli. If undirected, learning is often, if not always, a most difficult and wasteful procedure, since the learner must ascertain by the trial and error method the best way to master the task in hand, and also how to deal in a successful way with the many difficulties which that particular type of learning presents. In the learning which takes place in the schools, learners are directed by skilled teachers in order to prevent as far as possible the blind fumbling which accompanies undirected learning. The chief duty of a teacher is, therefore, to make any case of learning as economical and efficient as possible; and the most effective method of teaching any subject can be devised only after it has been ascertained how the subject to be directed is actually learned and what psychological conditions must be fulfilled if the learning is to take place easily and naturally and with normal improvement following. Teachers of Latin have been slow to grasp these facts, many of them adhering to old moth-eaten methods of teaching rather than adjusting their teaching to the needs and requirements of their students.

In order that teachers of this subject may obtain a more definite idea of just what may be done to render the most helpful assistance to learners

of this subject we shall close our analysis of the learner's task with a brief description of some of the psychological factors that condition a student's success in learning to read Latin.

8. SOME PSYCHOLOGICAL FACTORS INVOLVED IN SUCCESSFUL LEARNING

"To succeed in any instance of learning, the learner must first of all believe in the possibility of success.[2] This belief is born of previous successes and is in direct proportion (so far as its strength and persistence are concerned) to the habit of succeeding that has been established by previous learning. Nothing, therefore, is more important than to develop in learners the habit of succeeding with every task assigned to them." Most failures of pupils in elementary and secondary schools are due to the fact that the young people are given work to do in which they cannot succeed or else not given enough work to do in which they really can succeed. Success creates an atmosphere of confidence. Failure creates an atmosphere and a belief that retard the learner's progress. The very habit of succeeding is therefore a necessary factor in producing success, and the unpardonable sin for teachers is to give their pupils too many things to do which they cannot do or that they cannot do well.

There are two important sides to the creation of this right attitude toward success: (a) Learners must be made to believe that success is possible for them. This attitude can be induced by giving pupils a type of direction which keeps them succeeding most of the time. (b) The learners' tasks must be adjusted to their individual abilities to learn so that they can be kept succeeding most of the time.

(2) Furthermore, to obtain the best results in any instance of learning a student must be *interested in his own advancement*, and be shown by actual measurement that he really can improve. He should also be helped to identify the sources of his gain. A teacher should therefore have reliable standards for measuring progress in learning, viz., methods and norms that will not merely enable her to evaluate their gains in terms of norms but will show what may reasonably be expected from each learner, taking into account his native endowments or ability to learn.

By giving students the kind of direction that will enable them to succeed and then by actual measurement demonstrating the fact of im-

[2] Book, W. F. *Learning to Typewrite.* (New York: The Gregg Publishing Co., 1925), Chapter XX.

provement, a teacher may create the necessary confidence to develop an interest in and a genuine desire for further improvement.

(3) The belief in one's ability to succeed is closely related to the attitude which a learner should have towards the task of learning taken as a whole. One of the most important gains which a learner of Latin can make is to become more and more pleased with the task of learning taken as a whole and more genuinely interested in doing the specific things which bring him success. The arousal of such interest in any case of learning taken as a whole together with a proper attitude toward success is, therefore, itself an important source of gain, since it facilitates many phases of the learning process and removes the artificial limits to improvement which learners so often set up for themselves.

(4) However, the most effective teaching of any subject can be devised only after the teacher has ascertained how the subject directed is actually learned. An accurate and detailed scientific analysis of the task of learning the subject to be taught is the only way in which the facts can be obtained that will enable teachers to give their students the exact kind and amount of help which they need. Thus in the teaching of Latin, before the teacher can hope to direct her students successfully, she herself should understand exactly what must be done by the student to learn the subject. According to W. F. Book, the purpose of such analyses should be to obtain facts needed by teachers to direct their students so that the learning may take place in the most economical way. "If we wish to control and direct any learning process in the most efficient manner we must determine what a learner in that type of learning must do, ascertain the best methods of doing these necessary things, determine all the factors (physical, psychological, physiological, etc.) which aid or retard the learners in doing the specific things that must be done to achieve the desired results; and lastly, in our measurement of the results, measure the progress which learners are making *in doing these necessary things*, rather than to measure total achievement in terms of the task to be performed, as is now regularly done when we use the available educational or achievement tests."[3]

In concluding our analysis of "learning to read Latin with ease and pleasure" (the objective set forth by the Classical Investigation of 1924) we therefore offer the following suggestions for the teacher:

[3] Book, William F. *Learning to Typewrite.* (New York: The Gregg Publishing Co., 1925), p. 157.

1. Make a job-analysis of the learner's task to determine just what your students have to do to learn the subject you are teaching.

2. Make an analysis of each day's lesson.

3. Study each pupil individually.

4. Select material suited to your pupils, and material that can be understood and interpreted by them.

5. Make assignments definite.

6. Make sure that the correct perceptual habits are being formed by giving your pupils practical experience in controlling the perceptual process involved in reading the Latin.

7. See that word and sentence-recognition habits are always practiced in their proper language settings.

8. Make a study of the difficulties involved, their cause, and at what stage in the learning they occur in order to be able to circumvent or forestall them.

9. Vary the stimulus (change assignments) so as to prevent *ennui* and the continued use of a particular set of sense organs and nerves.

10. Make the work interesting and purposive.

11. Arrange proper hygienic conditions (such as light, heat, ventilation, etc.) so that all conditioning stimuli will be as favorable as possible.

12. Adjust each learner's task to his ability to learn. One student may not be able to do as much of one kind of work as another student, yet be able to make up for it in some other way and so cover the ground.

13. Help students improve their methods of work.

14. Keep students encouraged; do not allow discouragement to creep in.

15. Avoid fatiguing students when starting a new subject. New work brings on fatigue more quickly than old.

16. Review every day some part of the work of previous lessons.

17. Give frequent tests to determine the pupil's reading ability and keep a record of their scores. This knowledge of success will serve as an incentive or stimulus to more and better work.

Some sort of an attitude towards every school subject and every learning situation will be established either consciously or unconsciously by every student. For some reason or other wrong attitudes seem to be aroused more easily than right ones. It is one of the most important duties of the teacher to see that only the most helpful attitudes are established, not only toward the case of learning in hand, but also toward their own success and ability to succeed with all their work.

This is especially true when students take up as difficult a subject as Latin. The right attitude not only toward the subject but also toward his own ability to succeed with the subject is essential if the student is to succeed.

Consequently one of the most important problems connected with teaching Latin is to make the student's task effectual as a stimulus. This means that each lesson must be presented in such a way that it will incite the student not only to respond, but will impel him to greater and greater effort until he has digested every point in the assignment and is eager for the next lesson.

No teacher of Latin nor of any other subject can arrange and present assignments in the way just mentioned if he or she has not made a careful analysis of the learner's task. He must ascertain how the subject is actually learned, see what pupils actually have to do while learning it, realize the difficulties involved and be ready to measure achievement not in terms of the task to be performed, but rather in terms of the progress that his learners are making in doing each necessary thing that must be done to succeed with the ease of learning in hand.

A STUDY OF A TRUE-FALSE AND INDETERMINATE STATEMENT EXAMINATION IN THE HISTORY OF EDUCATION[1]

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I. PURPOSE

THE main purpose of this study is to develop a scoring key for an examination of 160 true-false and indeterminate statements in the history of education. The method used was that of "pooling" the responses of 21 instructors in the history of education.

II. SOURCE OF DATA

Under dates of April and September, 1930, the following letter was sent to each of 36 instructors in the history of education:

My dear Mr. ——:
Enclosed please find two sets of true-false examinations, each containing 160 items. Each examination is introduced by a self-explanatory set of directions for response. Thirty minutes of time are required for each examination. I am asking you to answer the examinations and return the papers to me in the enclosed self-addressed, stamped envelope.
The purpose of this enclosure is to develop a composite key from the responses of experts in the history of education. The key is to be used to score the same examination when it has been submitted to students. These scores are to be analyzed as a part of a fundamental study to determine the effect of directions to true-false examinations upon student responses.
A copy of each composite key will be sent to you. At the conclusion of this compilation of data, the results of the study also will be sent to you. If you feel, however, that you do not desire, or cannot afford the time to coöperate in this work, kindly return the material in the enclosed envelope.
Allow me to assure you that your assistance in this work will be sincerely appreciated.
Cordially yours,

[1] Paper read before Section II, History of Education, of the National Society of College Teachers of Education, Detroit, February 24, 1931, and Section Q, American Association for the Advancement of Science, Pasadena, June 16, 1931.

III. CHARACTERISTICS OF THE SAMPLE

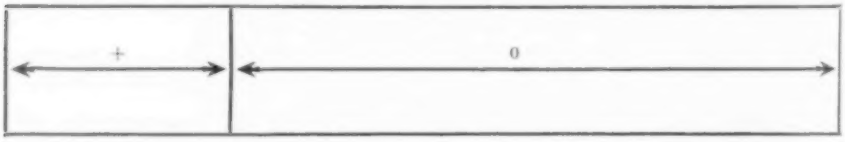
A. Amount and Distribution of the Data

The data sample includes 21 replies,[2] involving 6720 responses to 160 test items in each of two examinations. It is to be regretted that more did not answer. The content in each examination was the same, but the directions preceding each examination were different.

B. Major Types of Directions for True-False and Indeterminate Statements.

SET A

1. If a statement is entirely *true*, put a plus (+) upon the space to the left of the statement.
2. If any part or all of a statement is *false*, put a zero (O) upon the space to the left of the statement.
3. Do not omit any statement.



A decision scale from *entirely true* to any part or all of a statement being *false*.

SET B

1. If a statement is entirely *true*, put a plus (+) upon the space to the left of the statement.
2. If a statement is entirely *false*, put a zero (O) upon the space to the left of the statement.

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[2] The name and address of each person participating in this study follow: John S. Brubacher, New Haven, Connecticut; Forest C. Ensign, Iowa City, Iowa; Elmer H. Wilds for P. V. Sangren, Kalamazoo, Michigan; John C. Almack, Stanford University, California; F. G. Livingood, Chestertown, Maryland; Ava H. Chadbourne, Orono, Maine; Sheldon E. Davis, Dillon, Montana; H. G. Good, Columbus, Ohio; Lyndall Fisher Newens, Lincoln, Nebraska; Mrs. Nancy Wood, Lincoln, Nebraska; W. W. Kemp, Berkeley, California, assisted by Mr. Nason and F. H. Swift; A. L. Rhoton, State College, Pennsylvania; C. R. Wood, Jacksonville, Alabama; L. T. Baker, Columbia, South Carolina; E. P. Cubberley, Stanford, California; R. H. Eckelberry, Columbus, Ohio; P. J. Haggerty, Notre Dame, Indiana; W. J. Gifford, Harrisonburg, Virginia; B. E. Ogden, Bethany, Nebraska; E. R. Mervins, Bethany, Nebraska; C. C. Weidemann, Lincoln, Nebraska.

3. If a statement is doubtful as to whether *true* or *false*, put a capital letter D upon the space to the left of the statement.
4. Do not omit any statement.

Statement Is Entirely True	Statement Is Doubtful as to Whether True or False	Statement Is Entirely False
+	D	0

A decision scale from entirely *true* through *doubtful as to whether true or false* to entirely *false*.

SET C

1. If the chances seem to favor a decision that a statement is more likely to be *true* than *false*, put a plus (+) upon the space to the left of the statement.
2. If the chances seem to favor a decision that a statement is more likely to be *false* than *true*, put a zero (O) upon the space to the left of the statement.
3. Do not omit any statement.

Statement is likely to be True	Statement is likely to be False
+	0

Entirely True—True—True False—False—Entirely False

A decision scale which marks each statement

(1) *True* from the point of entirely *true* to the point which indicates the statement is more likely to be *true* than *false;* and

(2) *False* from the point which indicates the statement is more likely to be *false* than *true* to the point of entirely *false*.

SET D

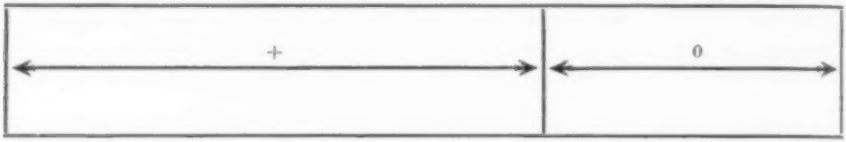
Mark the *false* statements with a zero (O).
Do not mark *true* statements.

SET E

(Opposite to Set A)

1. If a statement is entirely *false*, put a zero (O) upon the space to the left of the statement.

2. If any part or all of a statement is *true*, put a plus (+) upon the space to the left of the statement.
3. Do not omit any statement.



A decision scale from entirely *false* to *any part or all* of a statement being *true*.

C. Comments from Replies.

Among those who replied, there is a variation of interest.

1. "I am very much interested" . . . (followed by a four-page letter).
2. "Hope you let me see your results."
3. "I shall await with considerable interest the results of your study."
4. "I am greatly interested in what you are doing . . ."

From other replies the viewpoint was different.

1. "I have had some difficulty in marking the true-false statements and am commenting below on several of the items."
2. "I find it psychologically difficult to interpret these statements with scientific (math.) rigidity. . . . I am tempted to say that all historical statements are doubtful."
3. "I think you have an excellent idea here for the elimination of some of the weaknesses of the true-false type of examination."
4. "Before seeking to have us mark these questions you should have asked for improvements on the wording of questions. Your final results would thus have been more significant."
5. "I do not believe, however, that any of these in their present form should be used in true-false tests with a very intelligent class. Each presents too many angles for consideration."
6. "Personally I cannot see how any service can be rendered the history of education by a set of standardized tests. This is a field in which the answer to the question is either very evident and apparent, or it involves so much doubt that the answer has little value."
7. ". . . for a number of reasons I prefer to return the examinations to you unmarked."
8. "If time allowed, I should like to have attempted the rewording, of about fifty percent of the questions as I believe the ideas are better

than the wording. I have indicated some of my mental hunches marginally."

D. Relative Value of the True-False and Indeterminate Statements to Provoke Inquiry and Discussion.

At least forty of the 160 items of the examination were purposely constructed *doubtful as to whether true or false.* The returns show that a major part of the discussion, desirable alterations, rewordings, and the like are associated with these *indeterminate* items that are neither *true* nor *false.* A total of only twenty-five comments out of a possible total of 1848 were directed at those 44 statements which in each case at least 95 percent or more of the 21 judges marked as either *true* or *false.* The percent is about 1.3. On the other hand, a total of 215 comments out of a possible total of 5872 were directed at those 116 statements which in each case less than 95 percent of the 21 judges marked as neither *true* nor *false.* This percent is slightly less than 4, about 3 times the preceding 1.3 percent.

The writer hazards the opinion that so far as instructors and students are concerned, it is not the statement which is definitely either *true* or *false* that prompts inquiry and discussion, but those statements which are *indeterminate* and *doubtful as to whether true or false.*

E. Examples of True-False Statements in the History of Education.

A partial list of the 44 statements judged as either *true* or *false* by at least 95 percent of the 21 instructors, follow. 1 equals True; 5 equals False.

1 — *1.* Close adherence to custom and tradition was characteristic of primitive education.
5 — *5.* Primitive education was ineffectual in that it did not achieve its end.
1 — *13.* Spartan education was shaped entirely with reference to the welfare of the state.
1 — *16.* Spartan education was chiefly physical.
5 — *25.* The early Romans looked for harmony, proportion, and grace as educational aims.
1 — *29.* The Romans contributed the organization of law and government to our civilization.
5 — *34.* The early Romans stressed art and literature in their education.
1 — *46.* The conflict between reason and faith was a factor in the development of scholasticism.
1 — *54.* Scholasticism tended to stimulate intellectual interests.
5 — *59.* The rule of Benedict required monks to devote all their time to manual labor.

1 — *66.* The burgher schools represented the interests of the mercantile or industrial classes.

5 — *75.* The Renaissance discouraged the tendency to new inventions and discoveries.

5 — *77.* There are no evidences of the effects of the Renaissance in present day education.

F. Limitation and Value of the True-False Statement in the History of Education.

It would seem that in practically every case, the foregoing *true-false* statements are self-evident facts to be memorized. They offer little in the way of an opportunity either to develop the student's general reasoning abilities or to aid the instructor in the teaching process. It would seem that the instructional value of the *true-false* statement for the history of education, at least, is more limited than heretofore has been assumed. This further indicates that the *true-false* statement in the history of education may be used to test by recognition the learning of facts involving little or no general reasoning ability.

G. Inconsistency of Responses Among the Returns.

Even though the 21 instructors had the materials at hand and would admit that their responses to each of the two sets of 160 examination items should be consistent even when answering under a different set of directions for each set of 160 items, some *inconsistencies* of response occurred. These inconsistencies of response included the same items answered *true* in one examination and *false* in the other examination. Additional correspondence with the instructors eliminated these *inconsistencies.* Of the 21 instructors, 14 were inconsistent in their responses with 1 to 33 of the 160 items. The frequencies were 33, 17, 17, 12, 9, 8, 6, 5, 4, 2, 2, 2, 2, and 2. The total of inconsistent responses is 121 out of a possible 3360, or about 4 percent.

What would have been the amount of inconsistency of response had the examinations been answered at different times and independent of each other? It is probable that the magnitude of the percent of inconsistency would most certainly be greater than is reported under conditions intended to minimize its magnitude. This study does not attempt, in any way, to indicate to what extent instructors agree concerning the content of the history of education. In this study instructors agree upon 44 items as either *true* or *false.* The percent of agreement among instructors concerning each of a sample of 32 items of the remaining 116 items is recorded in the "scoring key" following.

H. Indeterminate Statements.

Indeterminate statements are of at least three classes: (1) those *more likely to be true* than *doubtful as to whether true or false,* yet not *true;* (2) those *more likely to be false* than *doubtful as to whether true or false,* yet not *false;* and (3) those *doubtful as to whether true or false.*

These statements may be used to test the student's ability to judge the status of any item of subject matter that is neither *true* nor *false.* Such statements seem to involve the general reasoning ability of the student since the content of such statements involves the elements of inquiry and discussion more than is associated with statements definitely either *true* or *false.*

The *indeterminate* statement seems quite distinct from the *true-false* statement from the standpoints of construction and educational function.

IV. TREATMENT OF THE DATA

1. All data received were carefully checked, rendered consistent where needed. Each response was considered in the light of any comment which the instructor may have made in order to be relatively sure that the comment and response were consistent. This checking was done by two persons in conference.
2. No data were copied. All data were pasted upon background sheets so that all responses were in rectilinear alignment ready for the process of totalling types of response.
3. All totals of responses were entered upon summary sheets according to the directions preceding the examination. The totals were entered under Directions B and C, from which the key for Direction sets A, D, E, and F could be determined by cross reference. (The recommended directions, Set F, for *true-false* and *indeterminate* statement examinations are included at the end of this article.)
4. All totals of responses were checked and re-checked. All supplementary calculations were checked and re-checked.

Before the data could be stated in a form which would lead directly to the act of determining the answer or "key" for each test item, a definition for each type of test item included in the examination was necessary.

V. ARBITRARY DEFINITION FOR EACH OF FIVE TYPES OF STATEMENTS CONSISTING OF TRUE, FALSE AND THREE CLASSES OF INDETERMINATE STATEMENTS

The following definitions were applied to the total of responses under each set of Directions A and B and form the basis for the statement of

Direction Set F, which is recommended for use as an outgrowth of the results included in this study.

1. A statement was considered as *true* when 95 percent or more of the judges marked the statement as *true*.
2. A statement was considered as *false* when 95 percent or more of the judges marked the statement as *false*.
3. (a) A statement was considered as *doubtful as to whether true or false* when the sum of the total of the judgments of *true*—(A), and one-half of the total of the judgments of *doubtful as to whether true or false*—(B), divided by the total of all judgments times 100 is either less than 60 percent or more than 40 percent.
   (b) A statement was considered as *doubtful as to whether true or false* when the sum of the total of the judgments of *false*—(C), and one-half of the total of the judgments of *doubtful as to whether true or false*—(B), divided by the total of all judgments times 100 is either less than 60 percent or more than 40 percent.

   For example,
   Let A equal 16; 2B equal 9; C equal 17.
   Then 16 plus 4½ divided by 42 times 100 equals 49 percent,
   and 17 plus 4½ divided by 42 times 100 equals 51 percent.
   In each case the percents are greater than 40 and less than 60. The item is therefore *doubtful as to whether true or false*.
4. A statement was considered as *more likely to be true* than *doubtful as to whether true or false*, when the statement is neither *true* by Criterion 1, nor *doubtful as to whether true or false* by Criterion 3.
5. A statement was considered *more likely to be false* than *doubtful as to whether true or false* when the statement is neither *false* by Criterion 2 nor *doubtful as to whether true or false* by Criterion 3.

VI. RESULTS

The results of application of the foregoing definitions to the 160 test items of the examination, are illustrated in a sample list of 32 items at the end of this article. No defense is offered for the foregoing arbitrary method of definition, other than it seemed to be reasonable. Whatever definitions are acceptable to a given instructor may be applied to the foregoing scoring key with a result that the "keyed" answer to certain items will be changed. Certain items may even be omitted. A summary of the results by types of test items follows in Table I.

Of the 160 test items, about two are *true* to each one *false;* about two have a tendency to be *true* to each one having a tendency to be *false;* and about 10 percent are doubtful as to whether *true* or *false*. It is suggested in making examinations from these test items that about the same number

TABLE I

SUMMARY OF RESULTS BY TYPE OF TEST ITEMS

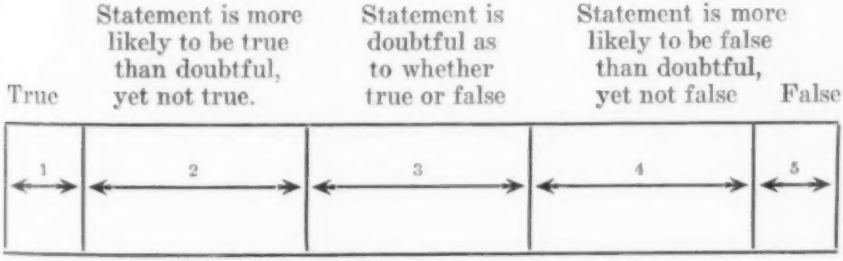
Scoring Key	Type of Test Item	No. of Items
1	True	30
2	Tendency to True	67
3	Doubtful as to whether true or false	16
4	Tendency to False	33
5	False	14
	Total	160

of *true* items as *false* items be used and about the same number of items with a tendency to *true* as items with a tendency to *false* be used. Any number of items doubtful as to whether *true* or *false* up to about a total of 25 percent of the total items in the examination may be used. No further information concerning these items such as their power to differentiate abilities, consistency, significance and the like is available.

SET F

Directions for True-False and Indeterminate Statement Examinations.

1. If a statement is *true,* put a figure one (1) upon the space to the left* of the statement.
2. If a statement is *false,* put a figure five (5) upon the space to the left* of the statement.
3. If a statement is *doubtful* as to whether true or false, put a figure three (3) upon the space to the left* of the statement.
4. If a statement is *more likely to be true than doubtful,* yet not entirely true, put a figure two (2) upon the space to the left* of the statement.
5. If a statement is *more likely to be false than doubtful,* yet not entirely false, put a figure four (4) upon the space to the left* of the statement.
6. Do not omit any statement.


Statement is more likely to be true than doubtful, yet not true.
Statement is doubtful as to whether true or false
Statement is more likely to be false than doubtful, yet not false
True
False
1
2
3
4
5

A decision scale from *true* through *doubtfully true,* through *doubtful as to whether true or false,* through *doubtfully false,* to *false.*

* Use "right," if preferred.

Percent Either True or False	Key	No. Item	
91 F	4	2.	The religion of primitive man was not an essential part of his education.
86 T	2	7.	The educational method of India consists of memorization of the text and imitations of the copy set.
88 T	2	12.	Oriental education was essentially education as recapitulation.
100 F	5	17.	There were no state supervision or control of education in Sparta.
93 T	2	22.	The Romans contributed the idea of a universal empire.
66 T	2	27.	Roman education produced a nation of warriors.
100 F	5	32.	The Sophists were teachers of Physical education.
55 F	3	37.	The Sophists introduced intellectual education.
63 T	2	42.	Christianity made a universal appeal.
74 T	2	47.	The monastic schools extended the development of the seven liberal arts.
95 T	1	52.	The monasteries of the Middle Ages are known as centers of learning.
98 T	1	57.	The lecture method was used in medieval universities.
88 T	2	62.	The monastic schools preserved the learning of the previous centuries.
100 T	1	67.	Industrial training in various crafts was received through the apprenticeship system.
88 T	2	72.	Religion plays a subordinate part as compared to humanism in the Renaissance.
98 F	5	77.	There are no evidences of the effects of the Renaissance in present day education.
52 T	3	82.	The burgher schools were responsible for the development of civic control of education.
76 T	2	87.	The Reformation launched the idea of civil support and control of schools.
98 T	1	92.	Sense realism may be termed the early scientific movement in education.
81 T	2	97.	Bacon formulated the inductive method of modern science.
62 F	4	102.	The Ritterkademien were the most influential educational institutions in Germany.
52 F	3	107.	The 18th century stands out as the century which introduced experiment.

88 T	2	112.	Rousseau emphasized "negative education."
88 T	2	117.	The psychological movement helped to reduce naturalistic principles to school room procedures.
55 T	3	122.	Pestalozzi was responsible for the reform movement of the 19th century.
76 T	2	127.	Froebel had a permanent effect upon education, but not an immediate effect.
91 T	2	132.	Pestalozzi conducted one of the first industrial schools for the poor.
91 F	4	137.	Herbart was unable to develop a general method for classroom procedure.
62 T	2	142.	A decline in Massachusetts education followed the transitional period.
88 T	2	147.	Henry Barnard is regarded as the greatest scholar of the educational awakening.
51 F	3	152.	Montessori lays too much stress upon the acquisition of the formal studies.
88 T	2	157.	Modern times are characterized by the almost universal attention now given to the education of mental defectives.

VII. METHOD OF RATING EACH OF THE 160 EXAMINATION ITEMS

To each instructor was sent a copy of directions Set B attached to a copy of the 160 examination items, and a copy of directions Set C attached to a second copy of the same examination (See III, B, Directions Set). The returned responses to each item of the examination were recorded according to the technique which follows.

A. If a statement were marked *true* under directions Set B and directions Set C, it would be keyed as *true* under directions Sets A, D and E.

B. If a statement were marked *false* under directions Set B and Set C, it would be keyed as *false* under directions Sets A, D and E.

C. If a statement were marked *doubtful* under directions Set B and *true* under directions Set C, it would be keyed as
   1. *false* under directions Set A rather than *true*.
   2. *true* under directions Set D* and
   3. *true* under directions Set E.

D. If a statement were marked *doubtful* under Set B and *false* under directions Set C, it would be keyed as
   1. *false* under directions Set A

2. *false* under directions Set D* and
3. *false* under directions Set E.

Each statement in the examination was keyed for each of the direction sets according to the foregoing technique. Each statement was keyed for directions Set F, by comparing the distribution of 42 judgments for each examination item listed by directions sets B and C.

VIII. PROFESSIONAL USE OF THE TECHNIQUE AND MATERIALS OF THIS STUDY

Keying any given examination item or question is accomplished upon either an *individual* or *social* basis. Upon the *individual* basis the methods which should be specified in the examination are: A. an authority other than the instructor, to whose publication or oral statement the instructor usually refers, B. the instructor as the authority, C. the opinion of the individual student who is registered with the instructor (usually a very poor and indefensible keying method, especially with essay responses) and D. any combination of the foregoing not specified in the examination item, resulting in unsatisfactory attitudes within the student, within the instructor and in the reciprocating instructional response relationships between the student and instructor and, therefore, should never be used. The foregoing methods are quite personal in each case.

Upon the social basis the methods are more impersonal and are specified to the student group either orally by the instructor or in writing immediately preceding the directions set of the examination. These methods require the use of arbitrary definitions (Examples, See V for each of 5 types of statements) as a means to key each item. The methods are: A. the collective opinion of authorities whose publications apply to the item in question, B. the collective opinion of instructors who are actively teaching the subject in which the item in question occurs, C. the collective opinion of a group of students concerning the item in question, D. consolidation of any combination of the foregoing three *social* methods of keying any given examination item. This particular article utilizes *social method*, B, which probably more or less directly involves *social method*, A. The size of the group for either *social method*, A or B, is recommended to be not less than 20. For *social method* C, the size of

* Direction Set D lacks the clarity of statement which is a part of Sets A, B, C and E as well as F. The responsibility of defining Set D rests with the instructor. Also the basis of keying each examination item rests with the instructor. Set D, therefore, is unsatisfactory for the purposes of examination.

the group should probably not be less than 100 upward to 500, depending largely upon the nature of the subject matter in question. Upon these latter points, studies of reliability and validity need to be executed. The implication for instructional use of the *social basis* is a broad impersonal basis, rather than the personal or individual basis, for keying the acceptable response or answer to any given test item.

A personal interview with co-author Newens who functioned as one of the 21 active classroom teachers during the period of this study revealed the following observations:

1. The study indirectly caused a wider use of textual and supplementary materials.
2. The testing device caused the teacher to feel and attempt to meet the need of more accurately defined purposes, functions, objectives and aims of the course of instruction.
3. The teacher felt the need of striving to be less dogmatic in attitudes and decisions relative to the content of the course.
4. The wider use of course materials suggested the assignment that each student should develop the historical phase of a problem of vital interest to the student.
5. The use of the *indeterminate statement* as a part of an examination, served as a means in aiding the development of organized discussion during the class hour initiated by the students registered in the course. These reciprocating response relationships are a basic feature of effective learning.
6. The study caused the teacher to appreciate the importance of the need of exercising great care in the construction of test items based upon the instructional content of the course.
7. The instructional value of the sampled and keyed materials included in this article is very limited. A copy of the entire examination keyed according to Directions Set F may be secured by writing to either of the authors.

IX. CONCLUSIONS AND RECOMMENDATIONS

1. This study is concerned largely with technique.
2. This study arbitrarily defines a true statement, a false statement and three sub-types of indeterminate statements, one with a *tendency to true*, another with a *tendency to false* and a third *doubtful as to whether true or false*.
3. The "pooling" of the responses to test items by instructors in the history of education puts the "scoring key" upon a broader and more impersonal basis than a "scoring key" developed by a single instructor.
4. The foregoing technique is offered that others may test its acceptability, as a procedure to follow in constructing *true-false* and *inde-*

terminate statement examinations in the history of education. It should be useful in any subject matter similar in nature to that of the history of education.

5. There seems to be some doubt concerning not only the possibility of construction of worthwhile *true-false* items in the history of education, but also their value as aids in the process of instruction. In the main, their value seems limited to the testing of factual phases of the subject and possibly the simpler forms of general reasoning ability. Certainly many important items of the history of education are *indeterminate*, at the same time are important. They contain valuable teaching content from the standpoints of inquiry and discussion during the process of classroom instruction.

SHORTER ARTICLES

A COMPARISON OF THE OCULAR CHARACTERISTICS OF UNSELECTED AND READING DISABILITY GROUPS

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READING disability is one of the foremost problems of elementary education. It consists of the inability to learn to read normally, even when the pupil is of average or superior intelligence. This disability has often been mistaken for dullness and the pupil has been side-tracked into some occupation not requiring much intelligence. This frequently has resulted in a loss of service to the community, while the individual has been deprived of certain intellectual pleasures and associations which might have meant much to him. Too little is known of the etiology and treatment of reading difficulties, and definite information of this kind is urgently needed.

Reading is presented through visual channels, and a very natural inference is that if the visual system is defective reading must be impeded. Accordingly a study of the ocular characteristics of two groups of children has been made. One group was composed of one hundred fourteen reading disability cases, and the other consisted of one hundred forty-three unselected school children. Included in these totals are fifty-six unselected cases which were obtained through the coöperation of Superintendent Frank A. Scott and Miss Eleanor Hayes of the Belmont, Massachusetts, School Department. Most of the one hundred fourteen reading disability cases were taken from my private practice and I examined the others at the Harvard Psycho-Educational Clinic. Sixty-four of the reading disability, and eighty-seven of the unselected cases were studied separately and were reported in the Eye, Ear, Nose and Throat Monthly of April, 1931.

Visual acuity was measured monocularly with a standard Snellen chart at twenty feet. Coördination was investigated by means of a number of ophthalmic instruments, among which were the Stevens phorometer, Risley rotary prisms, Maddox rods, and double prisms. Adduction and abduction were measured by means of the rotary prisms. The use of a Wells-DeZeng phoroptor increased the accuracy of the measurements. In a previous study the median refractive errors exhibited by both the reading disability and unselected groups differed so slightly that no actual measurements of the degree of refractive defect were employed in this

study. Rather, a determination was made of the nature of the anomaly, regardless of its degree.

The characteristics and anomalies considered in this study may be explained briefly as follows: Visual acuity is exactly what the name implies. The refractive condition is the state of the eyes' foci. Perfect refraction is termed emmetropia and when it exists, rays of light form images of distant objects on the two retinae when the eyes are at rest. When the rays meet the retinae before focusing, the condition is called hypermetropia. This may be overcome and vision cleared by ciliary compensation, but at the expense of considerable eye strain. When the rays focus before reaching the retinae the condition is known as myopia. This is commonly called near-sightedness. Astigmia is the term applied to uneven focusing. When the eyes coördinate perfectly they are said to be orthophoric; when they *tend* to deviate outward the condition is exophoria; when inward, esophoria, and when one *tends* to turn above the other they are hyperphoric. Ductions are measurements of the extent to which antagonistic prism power may be introduced before the eyes without dissociating the images. These measurements are helpful in investigating incoördination.

Table I presents a comparison of the reading disability and unselected groups in all characteristics investigated, except refraction which is considered separately in Table II. The tendency is for the reading disability group to exhibit poorer vision, greater degrees of exophoria in distance and near vision, and lower ductions. Specifically, the differences between the medians of the visual acuity distributions are too small to be significant. A definite tendency of the reading disability group toward a greater degree of exophoria in distance vision is noted in the difference between the medians of the distance vision coördination distributions, and a very pronounced difference exists between the medians of the distributions of degrees of coördination at the reading distance. It indicates a greater degree of exophoria at the reading distance among reading disability cases. The difference is highly reliable statistically and is regarded as being very significant. No figures for the state of vertical coördination are presented because only one case of hyperphoria was found in the reading disability group, and none among the unselected cases.

In Table II the groups are compared according to the percentages exhibiting each refractive condition, the eyes being considered separately. The percentage of emmetropia (correct focus) is less in both eyes, in the

TABLE I

COMPARISON OF READING DISABILITY AND UNSELECTED GROUPS

Characteristic	Reading Disability No. Cases	Md.	Q_1	Q_3	Unselected No. Cases	Md.	Q_1	Q_3	Difference between medians	P.E. of Diff.
Visual Acuity										
Right eye	114	28.225′	23.629′	38.333′	143	27.747′	23.818′	34.621′	.478	1.631
Left eye	114	28.032′	23.360′	36.600′	143	27.606′	23.803′	34.568′	.426	.960
Coördination of the eyes										
Distance Vision (6 M)	113	0.545 Exophoria	2.482 Exophoria	1.392 Esophoria	143	0.026 Exophoria	0.653 Exophoria	0.600 Esophoria	.519	.236
Reading Distance (40 cm.)	110	3.333 Exophoria	0.357 Exophoria	5.649 Exophoria	143	0.175 Exophoria	0.961 Exophoria	0.609 Esophoria	3.158	.325
Duction										
Adduction	89	12.863	9.312	20.750	142	14.200	10.900	18.357	1.337	.857
Abduction	85	6.970	5.683	8.982	142	7.692	5.900	11.062	.722	.235

Visual acuity measurements are expressed in feet, Coördination measurements in prism diopters of imbalance, and Duction measurements in diopters of prism power.

TABLE II

COMPARISON OF REFRACTIVE CONDITION OF THE READING DISABILITY AND UNSELECTED GROUPS

Characteristic	Reading Disability			Unselected			Differences between groups	
	Right eye	Left eye	Diff. between eyes	Right eye	Left eye	Diff. between eyes	Right eye	Left eye
Emmetropia (no refractive error)	12.4%	9.7%	2.7%	19.4%	20.8%	1.4%	7.0%	11.1%
Hypermetropia	43.4%	42.4%	1.0%	27.6%	25.9%	1.7%	15.8%	16.5%
Hypermetropic Astigmia	28.3%	34.5%	6.2%	35.2%	37.3%	2.1%	6.9%	2.8%
Myopia	3.5%	2.6%	0.9%	7.5%	6.9%	0.6%	4.0%	4.3%
Myopic Astigmia	12.4%	10.6%	1.8%	10.0%	8.8%	1.2%	2.4%	1.8%

reading disability group, than in the other. In the same group the percentages of hypermetropic astigmia and myopia are less in both eyes. The percentage of myopic astigmia in this group is greater in the right eye and less in the left. Both groups present greater percentages of hypermetropia, myopia and myopic astigmatism in the right eye than in the left, and a greater percentage of hypermetropic astigmia in the left eye than in the right. They differ in that the percentage of emmetropic right eyes is greater in the reading disability group, and the reverse in the unselected group. The most outstanding difference between the two eyes in either group is in the percentage of hypermetropic astigmia in reading disability.

The principal fact brought out by this study is that, in reading disability, the eyes are more exophoric at the reading distance. It indicates that exophoria in distance vision, and lower lateral ductions may be expected, and that hypermetropia is even more common than among unselected school children.

How can exophoria at the reading distance, interfere with a pupil's ability to learn to read? Certain indications have been observed in private practice and clinical work which may be illuminating. Exophoria is an anomaly of ocular coördination, consisting of a tendency of the visual lines to deviate outward from parallelism when the eyes are at rest. This tendency is carried over when the eyes are in use and results in imperfect convergence, fixation, etc. When the eyes deviate, the retinal images no longer fall on corresponding points of the two retinae, and the resulting mental picture is blurred and confused. Double vision may result and the visual image caused by the stimulation of one eye, may be imperfectly superimposed on that of the other. In the interest of clear, single vision, nature introduces an element of mental and muscular compensation which requires an excessive innervation, resulting in fatigue. Fatigue varies with the degree of defect, the length of the period during which compensation is required, and the physical stamina of the individual. Although compensation can clear vision, fluctuation occurs, causing the eyes to waver, and this increases with fatigue. Faulty eye movements may be habits conditioned by this wavering.

The superimposition of the images of words and letters that often occurs in exophoria creates mental impressions of a composite word or letter form, which may be quite unfamiliar, or may blend into a familiar looking symbol. This can be demonstrated by looking through a stereoscope at a stereograph with the letter F on the left, and the letter L on

the right. When the retinal images of these two letters are made to fall on corresponding retinal points, and the two visual impressions are correctly superimposed, the mental picture is E. It results from the fusion of the letters F and L. Similarly the letter forms D and P, when superimposed, present a form not unlike the letter B. Combinations of letters such as W and S, for example, appear as an unfamiliar form.

When the eyes are at rest and without compensation, one prism diopter of exophoria will cause the visual lines to tend to separate to the extent of one centimeter at a distance of one meter. At the reading distance, forty centimeters, the separation is four millimeters. This is about the length of a three letter word in ordinary type. Therefore the maximum amount of lateral shift that may be expected at the reading distance equals four times the number of prism diopters of exophoria, and the number of letters, including spaces between words, that may be expected to shift equals three times the number of prism diopters of exophoria. The same rule applies as well to esophoria, when it occurs. The shifting results in superimposition of different letters and the overlapping of words.

In practice I find that exophoria of one or two prism diopters can be overcome by compensation without very serious discomfort or lateral shifting when the child is tired, provided he is strong and in good physical condition, but exophoria of three prism diopters or over, occurring at the reading distance, especially in reading disability cases, is nearly always troublesome, although the patient may not be conscious of much discomfort, and treatment for eliminating the defect is decidedly indicated. The use of glasses is avoided as much as possible but they are sometimes necessary in reestablishing correct innervations, and through these, correct coördination.

EDITORIALS

EXPERIMENTALISM AND THE IMPROVEMENT OF TEACHING

There appear to be three fairly well recognized groups of individuals striving for leadership in the field of education; each represents a fairly distinct point of view: (1) There are the *conservatives* who believe that our methods of classifying, instructing and measuring pupils are approximately all right as they are. Individuals of this group, while advocating minor adjustments here and there, feel that the system of instruction now in vogue is fundamentally correct, except as it may have deviated in more recent years from the accepted procedures of the past. The members of this group are particularly devoted to discipline, hard work and the mastery of subject matter. (2) There are the so-called *progressives* who find themselves opposed to what they regard as the formalism of the conservatives and the time-consuming mechanisms of the scientific experimentalists. They ask particularly for a child-centered education, *i.e.*, an education that considers the whole needs of the child, instead of the needs of subject-matter. To this end they have suggested new curricula, new methods and new schools; and (3), there are the *scientific experimentalists* who may or may not believe in change, but who believe that practices should be incorporated in the school program only after careful objective verification. They object particularly to being led here and there according to the catchwords or slogans of the opportunists or the fashions of the hour. They may be either conservatives or progressives as far as their philosophy of education is concerned.

The point of this editorial is to call attention to a certain confusion that has arisen out of this tri-headed leadership in the field of education. The particular confusion to which the writer wishes to direct attention here is to that growing out of the use of the term "experimentalism." Experimentalism is sometimes used in the sense of trying out something new. One may, for example, try out, under observation, a new tire on one's car; a new method of protecting perennial plants against freezing; or a new procedure in making an assignment. In these instances, the word "experiment" is used in the layman's sense of trying out something new, with the thought of seeing what happens. This is an exceed-

ingly valuable mode of behavior. The American Indian, for example, learned from this form of behavior that two fish planted in each hill of corn makes better corn; that a circle around the moon portends foul weather, etc. Many of our present theories of education rest upon these non-scientific observations of the more alert members of the profession. This uncontrolled sort of experimentalism, valuable as it is, must not, however, be confused with scientific experimentalism in which the various experimental variables are specifically enumerated, described, controlled and objectively measured. From the point of view of the scientific experimentalist lots of good hard money has been wasted in the innumerable unevaluated experiments of which the past is replete. Of course, he does not really mean that the money is wholly wasted, because all such tryouts have value. Neither does he mean *unevaluated*, because the non-scientific experimentalist does evaluate even though his evaluations are fragmentary, non-quantitative, and subjective. The scientific experimentalist objects to these non-scientific evaluations because of their unverifiable character except to the individual experimenters, themselves. They contribute, from the point of view of the experimentalist, only hypotheses to the sum total of verified knowledge. This double use of the term "experimentalism" or "experimentation" has led to no end of confusion in the field of education. This situation is particularly regrettable because of the state of mind in which it leaves the field workers of our profession, especially those seriously attempting to improve the conditions of classroom instruction.

Without entering further into the responsibilities of the conservatives and progressives for this state of affairs, I wish to discuss somewhat further the responsibilities of the scientific experimentalists. The scientific experimentalists seem to have added to this confusion in four respects: (1) In evaluating educational practices, scientific experimentalists have frequently failed to indicate their standards of reference. The goodness, the satisfactoriness and the effectiveness of educational practices are always determined in terms of some assumed or expressed needs, ends, or goals. Some experimentalists rigorously indicate that the results obtained in their experiments hold true only for the values measured by the instrument of measurement employed in their experiments. One may, for example, in an experimental study of relative merits of logical organized subject-matter and the activities curriculum, employ only information tests. Of course, information tests measure only one of the many outcomes of such instruction. The careful experimenter, at the

completion of such an investigation, carefully indicates that the results obtained are true only for the informational objectives of education. Unfortunately, however, many field workers not trained in the scientific method, interpret the results of such experiments to mean that logically organized subject-matter is superior to the activities curriculum, or *vice versa*. Then again, some experimentalists overlook the fact that educational practices need always to be evaluated in light of the objectives of education. (2) The products of scientific experimentalism are frequently of a fragmentary character. Instead of selecting some problem and sticking to it, many researchers select a problem, conduct a single excursion in the field, and then desert the undertaking before results of any consequence are attained. This habit of research workers is particularly exasperating to consumers of research. The practice may lead to out and out malfeasance as it has in the case of the whole or the part methods of learning. Quite a few individuals have obtained the idea that this issue is pretty well settled when, as a matter-of-fact, the problem is just beginning to be understood. Most of the work in this field has been done with a very limited kind of material. There are many variations of individual idiosyncracies, assortment of materials, and variation in lengths of tasks that need to be explored before we know a great deal about the relative merits of the whole and part methods of learning. The researches in reading, arithmetic and handwriting appear to be an exception to this general state of affairs. (3) Scientific experimentalists all too frequently limit themselves to tests of the more formal products of learning. Not only have evaluations been made from single and isolated points of view, as set forth above, but too frequently they have been made from a purely academic point of view. While this practice was probably somewhat justified ten or fifteen years ago, in the first stages of test construction, it can hardly be justified to-day with the many tests, rating scales, questionnaires, and other well validated data-gathering devices available for evaluating non-intellectual aspects of education. The average field worker might be somewhat more convinced were he to find in the literature of education more scientific experiments evaluating educational procedures from the points of mental techniques, the emotional reactions of pupils, attitudes, ideals, interests, etc.; and (4) scientific experimenters have failed, in the writer's opinion, to give adequate attention to more recent doctrines of education such as those set forth by the so-called progressives. While the doctrines of this group of educationalists are by no means new they deserve scientific verification. It

is a curious fact, for example, that the child-centered school idea with its centuries of philosophical support has had so little serious scientific attention. To assume that these hypotheses are unworthy of scientific verification is to take a very unscientific position. If educational practices are not to be decided by those that can talk the longest and hardest and fastest, scientific experimentalists will need to give serious consideration to these facts.

A. S. Barr

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Miami University, Oxford, Ohio.

COLE, ROBERT D. *Modern Foreign Languages and Their Teaching.* New York: D. Appleton & Company, 1931. xxiii + 598 pp.

This book gets together all the known material relating to the teaching of French, German, and Spanish in the United States. Its attitude is judicious and its analyses clear. In bibliography it is well-nigh exhaustive, in fact, the author adduced even the unpublished masters' and doctors' dissertations and indicates their contents as far as he was able to learn about this. The author has followed the traditional arrangement with chapters on all the important subjects in modern language teaching. In addition to the bibliography in each chapter, there is a long and valuable one as an appendix.

The only thing of importance I would wish different is the author's evaluation of modern languages as a school subject, and since this is a thing of importance I may be pardoned for going into it in some detail. I will follow out his proof that modern language teaching has been unsatisfactory and that they "should be included in the curriculum only in their application to spare-time activities." First to state that 36 percent of selected teachers voted that only 50 percent of their pupils achieve objective *A* (reading ability) in two years, that 18 percent voted that only 50 percent of their pupils achieve objective *B* (speaking knowledge) in two years, and that 40 percent voted that only 50 percent achieve objective *C* (writing ability) in two years is misleading. Instead we may, basing on the same statistics, state that these percentages voted that 50 to 100 percent of their pupils achieve the results stated and that the remaining 64, 82 and 60 percent, respectively, are not on record and that there is nothing to indicate that they believe that less than 50 percent of their pupils achieve these results.

Cole's second line of approach to find out how the objectives are being realized is through the results of the College Entrance Board examinations. Again he fails, I think, to make a proper exposition of the results. It may be true that "the results . . . . are not particularly satisfactory" but, as a matter of fact, they are entirely favorable to modern language. It has, for the last 25 years, stood consistently well above the average (roughly 800,000 papers enter into the tabulation) which is true of no other subject except Greek. This, however, with 15,000 papers is not comparable to modern languages with 140,000 papers which means, as we know, that Greek classes were much smaller.

The third line of approach is through the results of achievement tests. The results again do not constitute an indictment of modern language teaching. The results as Coleman gives them and as Cole states them (p. 30) are not unacceptable, for if 50 percent achieve reading, speaking, and writing ability it means that there is also partial achievement of these abilities by the rest of the class. Besides we do not know as much about these tests

yet as we hope to. It may be that abilities begin to function at lower levels than the tests assume.

Modern language is, as a rule, begun in the senior high school or exceptionally in the junior high school. The pupil beginning modern language here has never had a study comparable to it in method, and it is the only subject which is encountered in this unprepared way, for the method and learning processes of rural and social science have been fully anticipated in their antecedent work in the grades. This handicap of the modern language teacher has been overlooked.

We now come to Cole's conclusion regarding the place of modern languages in the curriculum which reads: "It is only in their application to spare-time activities that their values seem unquestioned. If this is so, the educational implication is clear; they should be among the variable, not the constant, subjects of the curriculum and the work should be conducted largely upon what Bobbitt calls the 'play level.'" He comes to this conclusion by checking off from Bobbitt's list of ten proper aims of education all except number five, as not realizable through the study of modern language.

I see no reason for using Bobbitt's list which is one of dozens of such lists. Instead, and for the sake of brevity, let us take the one prepared by the Commission on Reorganization of Secondary Education whose objectives have come to be widely followed and known as the Cardinal Principles of Secondary Education.[1] They are: 1. Health; 2. Fundamental Processes (reading, writing, mathematics, arts of oral and written expression); 3. Home Membership; 4. Vocation; 5. Civic Education; 6. Use of Leisure; and 7. Ethical character.

[1] Commission on the Reorganization of Secondary Education, U. S. Bureau of Education, Bulletin No. 35, 1918.

Bobbitt thinks modern languages should be taught as spare-time activities only (in our list, number 6). I think Bobbitt's question, applied as the crucial test to all subjects: What defects in civic performance are due to a lack of knowledge of foreign languages? and so on for the other desirable objectives and the other branches, and then answered *ex cathedra*, since he has never learned where or how people have learned the desirable qualities shown in civic life, etc., is arrant dogmatism. If this were followed, it would reduce the curriculum to the three R's, a little social science and the manual arts. I will let the Commission quoted above answer for us in regard to two objectives,—home-membership and civic virtues: "Literature should interpret and idealize the human ailments that go to make the home. Music and art should result in more beautiful homes and in greater joy therein. Civic education should consider other nations also, as a people we should try to understand their aspirations and ideals that we may deal more sympathetically and intelligently with the immigrant coming to our shores and have a basis for a wiser and more sympathetic approach to international problems. Our pupils should learn that each nation at least potentially has something of worth to contribute to civilization and that humanity would be incomplete without that contribution. This means a study of specific nations, their achievements and possibilities, not ignoring their limitations. Such a study of dissimilar contributions in the light of the ideal of human brotherhood should help to establish a genuine internationalism free from sentimentality, founded on fact and actually operative in the affairs of nations."[2]

[2] *Op. cit.*, pp. 14-15.

It goes without saying that modern language may, as well as all other branches, properly be carried on as a leisure-time activity, and, of course, it should function in helping to form character. At least it is our accepted educational theory that character should be taught and formed not by any one branch but by all.

This is a sufficient justification for modern language teaching. It goes without saying that not every pupil should study modern languages any more than that everyone should study, for instance, manual training.

This judgment on the place and function of the modern languages in the curriculum is the Achilles heel in Cole's book and this question is one in which modern language teachers are most interested.

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NELSON, JANET FOWLER. *Personality and Intelligence.* New York: Bureau of Publications, Teachers College, Columbia University, 1931. 61 pp.

The narrow scope of this study hardly merits the broad and inclusive title assigned to it. The author is concerned with personality only in-so-far as it is revealed by the incidental activity in a test situation, and with intelligence only as it is shown by the test scores.

The purpose of the investigation is twofold: first, as to whether the incidental activity manifested by a child when he is taking an intelligence test is related to the score on that test, and second, to discover whether this activity reveals extrovert as opposed to the introvert type of behavior.

Intelligence tests, the Kuhlman Revision of the Binet Scale and the Merrill Palmer Performance Test, were administered to a slightly superior group of three-year old children. Of this group, 46 were girls and 45 were boys. A reliable method was developed whereby quantitative records were obtained of the responses other than called for by the test itself. The incidental behavior responses recorded were: resistance, or refusal to accept a given test, persistence, as measured by the time spent at a formboard test without obtaining a successful solution, spontaneous conversation, gross spontaneous activity, spontaneous repetition of a test or demand for other than test material, and spontaneous use of test materials for purposes other than indicated.

It was found that the behavior responses, with two exceptions, showed but slight relationship to the intelligence test scores. Both resistance and spontaneous conversation showed small but significant relation to the mental age. Sex differences were found to be negligible except for a possible tendency for the girls to have slightly higher intelligence scores than the boys. The boys, on the contrary, showed a slight tendency to exceed the girls in overt behavior responses.

The interrelationships of the various factors were, for the most part, negligible. As the author points out this may be due to the size of the group and to its high degree of homogeneity. The rather high intercorrelations between the various expressions of spontaneous behavior may possibly indicate tendencies toward an extrovert type of personality.

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Miami University

DOLCH, EDWARD WILLIAM. *Psychology and Teaching of Reading.* Boston: Ginn & Company, 1931. iv + 261 pp.

The writer of this volume has attempted to deliver in popular form to the classroom teacher "all that is known about how children learn to read." In

this task he has been handicapped by trying at the same time to discuss methods of teaching reading. The book is much better in its discussion of the psychology of the reading process than in the other aspects of the subject. It would have been better, in the writer's judgment, had one or the other of these things been done more fully and more concretely. As a result of the dual purpose of the volume, it fails to make a distinct and unified impression on the mind.

As a book intended for classroom teachers, the volume fails in concrete illustration and in simplicity of treatment. As a discussion of certain problems of learning in connection with reading, it is worthy of attention by mature teachers and reading specialists. There are certain new suggestions in regard to the nature of the reading process which are stimulating and worth reading.

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GATES, ARTHUR I. *Interest and Ability in Reading.* New York: The Macmillan Company, 1930. vii + 264 pp.

This book is a carefully written presentation of the evidence and the theory upon which a method of teaching children to read, different in many respects from the general practices in teaching reading, is based. In an earlier volume the author partially outlines his plan of primary reading. The present volume is an addition to the earlier volume, and reports new data that have not been published before.

The book does not purport to be a complete manual or textbook on the teaching of reading. The mature teacher of reading and the specialist in reading will derive a great deal of benefit from the clear presentation of the problems which it treats. The novice will profit by the study of the book in conjunction with other treatments of the teaching of reading.

The first part of the volume deals with the influence of vocabulary burden, type of material, literary characteristics, and reading purpose and situation upon interest and ability in reading. The author reports here new data on certain aspects of these problems. A part of the book reveals a serious effort to discover what type of materials are most effective in the development of reading abilities and tastes among children of the primary grades. While the data at times are scarcely sufficient to establish the reliability of the findings, the tentative nature of the findings is acknowledged. The efforts of the author and his associates to build up materials, which are organized on the basis of scientific research, to enable the child to learn to read with a minimum of difficulty exemplifies the modern spirit of inquiry to the highest degree.

The second part of the book is a discussion of the author's theory concerning the organization of reading materials for effective teaching, the general principles of method which he believes are established by his experimental evidence, and the outlines of diagnosis and remedial instruction based upon specific tests and followed by the use of carefully prepared remedial materials. Here the author explains his theory of an activity program in reading, organized in such a manner that incidental development of reading skill is avoided, and, at the same time, the essential features of an activity program are retained. At this point, the book makes a very significant contribution. Those interested in a concrete example of an activity program in a skill subject will read this part of the volume with great interest.

The chapter dealing with "methods of

developing fundamental reading skills'' is a further exposition of ''the intrinsic method'' earlier discussed by the author. The essential difference between this method and that which may be said to represent the more traditional attack is the emphasis upon the advantage which comes from so organizing materials for reading as to make isolated word drill and phonics exercises unnecessary. The author reports great success in the use of the method. It is essentially a reading for meaning method upon which all good reading specialists agree as sound. The difference is largely in the method of introducing words to children by such a gradual process that isolated drills are unnecessary and by integrating the entire reading program around centers of interest that cause the child to read for meaning constantly. So far, it seems to the writer that Dr. Gates has the best of the argument. It remains for someone else to show that there is a better way.

Interest and Ability in Reading is a well written book. The style is clear and effective; the illustrative material is abundant and interesting. All in all, this book represents a very important addition to the growing literature of reading.

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CALIVER, AMBROSE. *Bibliography on Education of the Negro,* Bulletin No. 17, (Washington: U. S. Government Printing Office, 1931). 34 pp.

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The author reports that 47.6 percent of the high-school graduates of 1930 and 1931 continued their work in institutions of higher learning, 15.3 percent are engaged in some form of commercial activity, 4.5 percent went into industrial work, 27.4 percent are at work or engaged in some activity other than commercial or industrial, and nearly 5.2 percent are unaccounted for.

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The author presents certain statistical data relating to state school-building codes.

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From a study of the eye movement and eye-hand span in typewriting. The author concludes that when reading copy for typewriting the subjects make many more fixations per line, and longer fixations, than they do in ordinary reading; rapid writers require fewer fixations per line than do slower writers; the eye-hand span is larger in the case of rapid writers; and the more rapid writers carry the span over the end of the line in the larger percentage of the cases.

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A series of six tests covering the facts of first year algebra. Forms A and B; teachers manual.

GREENE, H. A., JORGENSON, A. N., AND KELLEY, V. H. *Iowa Silent Reading Test* (revised edition). Yonkers-on-Hudson, New York: World Book Company, 1932.

The test measures comprehension: word meaning, sentence meaning, and paragraph meaning; organization: selection of central idea and outlining; ability to locate information: use of index and selection of key words; and rate of reading. Two forms.

KELLEY, TRUMAN L., RUCH, GILES M., AND TERMAN, LEWIS M. *New Stanford Achievement Test:* Form Z. Yonkers-on-Hudson, New York: World Book Company, 1932.

Form Z is the fifth form for the new Stanford Achievement Test. It is issued in two parts: (a) the primary examination for grades 2 and 3; and (b) the advanced examination for grades 4 to 9.

POTTHOFF, EDWARD F., AND COREY, STEPHEN M. *A Standardized Test in Educational Psychology,* Bloomington, Illinois: Public School Publishing Company, 1932.

Two forms for use in elementary courses in psychology: Part I, general educational psychology; Part II, the psychology of learning; and Part III, the psychology of school subjects.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Editor Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Purdue Research and Indiana Testing.—The organization of the Division of Educational Reference of Purdue University was formally approved by a vote of the board of trustees May 8, 1925. It is the function of the Division to study the instructional activities of the university, to serve as educational adviser to both faculty and administrative officers, and to publish the results of its studies in the form of bulletins.

The Division is directly responsible to the president of the university. Its immediate administration is vested in a director. Under his supervision, research is carried on by members of the Division staff. It also coördinates the research in problems of university administration and instruction conducted by various members of the faculty or by committees of the faculty.

No. 18 of the series, Studies in Higher Education, by H. H. Remmers describes the results of the first high-school testing program for Indiana on a statewide basis, administered at the close of the school year, 1930-31. A total of 101,597 tests were used by 240 high schools covering the subjects of English, Latin, algebra, geometry, biology, physics, history, typewriting, shorthand, bookkeeping, and French. The tests were based on the printed state course of study, were prepared coöperatively by subject-matter experts in high schools and colleges, and were evaluated by high-school teachers of the given subjects. The testing service is to be repeated annually.

New Education Building at Chicago.—The Graduate Education Building at the University of Chicago was erected with a part of the $1,500,000 given to the university by the General Education Board for the support of the scientific study of educational problems. This building has a statistical laboratory, a fully equipped apparatus workshop with a skilled mechanic, dark rooms for photographic work, laboratory rooms, record rooms, work rooms for members of the staff engaged in school and college surveys and other studies in the field of school and college administration, and a library with work space for 200 students and stack space for 100,000 volumes. The stack now contains 60,000 volumes on education. There is a special-collection room, where reports of school systems and colleges are made available for students of educational administration. In addition to the equipment described, there are office workrooms for the fifteen professors and the fourteen staff members of lower academic rank who give instruction in the department.

Educational Reorganization in Virginia.—During the past twelve months an effort has been made by the state department of education to analyze the school system of Virginia to the end that its most serious and pressing needs might be provided for, namely (1) a sound plan of financing the public schools, (2) a complete revision of the elementary and secondary school curriculums, (3) an enlargement of the administrative units of

the state, and (4) a careful study of the teacher-training program in the state. This work is being directed by the superintendent of public instruction, Sidney B. Hall.

Every effort has been made to develop and adopt a new plan of financing public education, in keeping with the factual literature on the subject, involving (1) a minimum, satisfactory educational program, and (2) distribution of the cost of maintaining this minimum program equitably between the state and the localities. The minimum educational program has been developed and placed before the General Assembly, with the request that the Assembly enact the necessary laws for financing the program.

The curriculum project has been inaugurated and progress is being made. The program consists of: (1) a year's study of curriculum problems, to acquaint teachers and school administrators of the state with the problems of the curriculum; (2) following the year of study, a series of committees, known as production committees, during the second year will select, organize, and attempt to validate the materials to be included in the curriculum; and (3) during the third year further experimentation and validation will take place. At the conclusion of the third year, it is hoped to have the materials and experiences selected, organized, and tested out in such manner that courses of study may be printed and issued from the state department of education. A significant feature of this project is that it calls for state-wide coöperation and participation.

Only preliminary steps have been taken toward developing plans for increasing the size of administrative units and for the teacher-training program. These projects will be worked out in their natural sequence. It should be understood, of course, that the size of the administrative unit receives some consideration in developing the financial program of the state.

Minnesota Curriculum Revision.—The state department of education in Minnesota is publishing a series of twenty-one bulletins dealing with the reorganized curriculum of the six-year high school extending from the seventh to the twelfth school year. The work is carried on under the general direction of an executive committee consisting of three members of the state department of education, two college professors of education, and a city superintendent. Fourteen subject-group committees with a total membership of fifty-four have been selected from the public schools, the state university, and the teachers colleges in Minnesota to prepare the material for the various bulletins. It is hoped that all of these bulletins will be ready for use in the high schools of the state by September, 1932.

Indianapolis Curriculum Study.—A current project in the Indianapolis public schools involves reorganization of the work of the seventh, eighth, and ninth grades. The ultimate objective is to bring about realization of the commonly accepted functions of the junior high school. Because such factors as building facilities and administrative grouping of pupils cannot be changed readily, the chief emphasis is placed at present upon: (1) reorganization of the curriculum, (2) modification of classroom organization and teaching technique, and (3) the proper articulation of the elementary and secondary schools.

At the beginning of the current school year seminar groups were organized to familiarize the teachers concerned with junior high-school curriculum problems in their respective subject-matter fields, and

throughout the first semester these groups met at various times to pool and discuss their library readings. Small production committees have been selected from each seminar group to prepare tentative courses of study for use next year. In addition to these school-subject committees, special groups are being organized to consider the problems of the program of studies, classroom organization and teaching technique, guidance, individual and group activities, and character and citizenship aspects of the curriculum. Nearly three hundred teachers, supervisors, and administrative officers are participating in the project.

Curriculum Making in Wheeling.—A curriculum revision program is under way in the Wheeling Independent School District of West Virginia. It is based on the activities program with integrated units of work. Dr. P. E. Harris of the University of Pittsburgh has been the consultant during the development of this project. Seventeen subject-matter committees are at work setting forth what they believe are defensible aims and purposes for the various school subjects and grade levels.

New Curriculum Material in Lakewood.—In order to measure the improvement made during each semester, new standardized spelling tests are being developed for the city of Lakewood, Ohio. These tests are based on the words studied each semester in each half grade. To test the words actually studied seems preferable in Lakewood to measuring results through the use of spelling scales.

The new elementary courses of study in social sciences are ready to set forth the philosophy and basic principles underlying a modern civilization. Units of understanding have been chosen and justified in the light of this philosophy. Much new content has been brought into the courses in order to achieve the aims set up for training children in a rapidly changing society.

Procedures and materials are being developed for service classes at the junior high-school level. These classes are organized to do remedial work in reading, mathematics, spelling, and writing. All work is developed on an individual basis.

Little Rock Curriculum Reorganization.—The plan of curriculum reorganization worked out in the secondary schools of Little Rock, Arkansas, may be considered rather typical of what can be accomplished in medium-sized cities with limited financial resources and limited facilities for research.

Under the direction of a general chairman a five-year plan was outlined according to which each principal and subject supervisor would sponsor one or more subjects in his major or minor field of interest. The general chairman prepared an outline of curriculum procedure for guidance in proceeding with the project, and secured the assistance of the state university in organizing an extension class in curriculum construction which was made the item of major interest for the year. Teachers' meetings were minimized and the extension class in curriculum construction was emphasized.

The class directed by the university and local sponsors met twice monthly. While the study of technical phases of curriculum construction went forward, the general chairman and the various committees prepared sample types of procedures and type units of curriculum revision. Each teacher participated in this work.

The school board provided textbooks and courses of study, and the university

credit offered for participation in the work of curriculum construction helped stimulate effort. Actual research was limited largely to such studies as one on grade placement of English skills made by the English committee. Unit reports were submitted to a reviewing committee and the general chairman, and final reports were approved by the general chairman before they were mimeographed and bound as completed projects. Nineteen volumes have been completed, and five or six other reports soon will be ready. A similar study is now under way which should culminate in better organized and administered extra-curriculum activities.

Curriculum Revision at Houston.—Since 1924 the schools of Houston, Texas, have been at work on the revision of the curriculum. In 1930 plans for further study were made. These plans involve the development and evaluation of a curriculum to be constructed largely around social themes, but including all the prescribed learning and also suggested ways of making it possible for each child to do what is best for him. During 1930-31 three teachers went to Teachers College, Columbia University, to work under the direction of Dr. Bruner and Miss Smith on the preparation of the new materials. Superintendent E. E. Oberholtzer and W. W. Kemmerer, Director of Research, also spent about six weeks working with these teachers at Columbia. During the summer of 1931 six teachers worked on this phase of the curriculum at Houston. This reconstruction on an integrated basis was begun in the fourth and fifth grades, and is now being extended into the junior high schools and the primary grades.

In the elementary division this curriculum is being tried out by four different methods of application. One group of teachers has been given complete freedom from artificial regulations governing time distribution, schedule, required skills, and other vestiges of the extremely formal curriculum. A second group works as does the first with the exception that certain proficiency in skills, as set up in check lists for respective grades, is demanded. The third group is a control group carrying on without change from its former program. The fourth group also is a control group, using, however, the new materials with the old methods. Seventy-five teachers and more than 2500 pupils are included in the four groups. In the junior high schools, with departmentalized instruction, the same course of study units are used by the different subject-matter teachers, each working on a phase of the same theme and topic.

The integrated curriculum will be measured in terms of the fundamental skills only in so far as these skills are needed. The real values of this curriculum are expected in terms of the growth of pupils' interests, ability to solve problems, adjustment to the situations arising in the classroom, and increased enrichment and understanding of life. Observation and personal reactions of parents, teachers, pupils, and special observers will be used in the evaluation, in addition to as many objective tests as can be justified. This new curriculum material is not yet available for general distribution.

Curriculum Developments in Los Angeles Elementary Schools.—The Division of Course of Study, with the coöperation of teachers, is preparing a digest of the curriculum. It will be a frame work for the many separate units and bulletins which constantly are being developed to answer the specific needs of teachers and children in various fields. The digest will include a statement of the general point of view, necessary items of information for teachers, sample programs for various situations, a list of units for each

grade from which choices may be made, a statement for each academic subject of the main considerations in carrying on the work, and a statement of promotion requirements for each academic subject and grade. While this digest offers to the staff a bird's eye view of the curriculum, the various units and bulletins used by each teacher on her specific problem offer enrichment and definite help. It is believed that the digest, with the portfolio of bulletins, makes it possible for the curriculum to be a constantly developing medium, and at the same time possess definiteness and flexibility.

Rock Island Projects.—The public school system of Rock Island, Illinois, with the fourth, fifth, and sixth grades organized on a departmental basis, is working out a unified curriculum in social science and in general science. An arithmetic experiment in percentage in the high-sixth grades of the city is being conducted with the coöperation of F. B. Knight of the University of Iowa. Special study of reading problems, initiated by W. S. Gray of the University of Chicago some years ago, is still in progress.

Publications of Rhodes Scholars.—The *American Oxonian* for January, 1932, devotes its 159 pages to a listing of the publications of Rhodes scholars. It is the first comprehensive bibliography of the work of this group, and was prepared by George Emerson Barnes.

New Journal.—The first issue of the *Journal of Negro Education* is to appear on April 1, 1932. This is a quarterly sponsored by the College of Education of Howard University, Washington, D. C. The editor-in-chief is Charles H. Thompson of that institution. The first number includes editorial comment; eight articles; a department devoted to current literature in the form of reviews, abstracts, and bibliography; and current events of national importance in negro education.

National Safety Council Organizes Child Education Section.—As the teaching of safety becomes more general, and the quality of the work improves, there is an increasing need for pooling experiences, and for giving publicity to approved and effective methods. Therefore, the National Safety Council has organized a Child Education Section corresponding to the other sections of the Council dealing with industrial and public-safety problems.

There are already seven hundred school members affiliated with the Council and these will form the nucleus of the newly organized Section. It is hoped that at least one executive from each school system will eventually become affiliated. The late Randall J. Condon was made the first chairman of the Child Education Section and Thomas W. Gosling of Akron is vice-chairman. There are committees on elementary education, secondary education, vocational schools, program, and membership. The activities of the Section group themselves under two heads, exchange of experience and supervisory service, and publication service. As these various committees carry on their work they will issue reports and studies from time to time which will be available to school members. Further information concerning the organization may be had from the Education Division of the National Safety Council, One Park Avenue, New York City.

The first meeting of the Child Education Section was held in connection with the Twentieth Annual Safety Congress in Chicago, October 12-16, 1931.

TESTS FOR THIS SPRING

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We have just published *Form Z* of both *Primary* and *Advanced Examinations*. With five alternative forms available, this widely used test battery is ideal for periodic measurement of achievement in grades 2 through 9.

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TESTS AND THEIR RELATION TO SCHOOL OBJECTIVES

New objective tests to be used by the teacher as a help in her efforts to develop the children's power to attack new experiences are ready for experimental use. To maintain interest by pupils in the mastery of problems, and to aid clear thinking in directing action toward the realization of ends and ideals are possibilities for such tests.

Used for the ends of instruction, these tests are to be considered as having the same purpose and value as the questions used by the teacher or pupils in class discussion. The differences in use are important.

The psychology of the use of questions in class discussion centers about the mental activities of response by which the reserve energy of present associations of ideas is brought into action and these ideas, through use in the discussion, are re-associated as knowledge common to the group.

The significant difference in the situation with test questions is due to the mental challenge of the test situation. A revaluation of the pupil's own ideas as they are called into use and take form as a definite ability of the thinking mind is the challenge of a test so organized as to discover the abilities acquired and to check the steps to knowledge.

The fundamental idea for education is that the human mind works toward knowledge as the guide of purposed action; i.e., toward a meaning for both mental and physical experiences, which meaning may be shared and corrected or adjusted by comparison with like knowledge of other minds. It is this assumption which distinguishes education from trained response by habits which may control physical instincts.

The added assumption touching the educational process concerns the associative activities of conscious thinking. Ideas are assumed to be centers of mental energy free to work interchangeably in their connections for fuller understanding of new relations. Consciousness is the result and the guide, as these associative activities reinterpret previous ideas by present and anticipated experiences of thought situations as well as of sensory contacts.

To make and to use tests that will aid in this educational process requires: special study of school possibilities; research in the detailed fields of instruction for each subject; and much experiment with possible arrangements of the testing material and of the ways to use the tests.

It is encouraging to note that several experienced teachers have, with the aid of research directors, undertaken the development of such material.

Detailed analyses in the fields of arithmetic, reading, and some of the high school subjects have lead to the publication of the latest type of objective tests known as "instructional tests." These tests are analyses of all of the abilities that are required and have no relation to any particular textbook. They discover for the teacher the abilities that are still required, and aid the pupil to organize his thought power.

The "instructional tests" now available from the Public School Publishing Company follow.

Read the next page, then join with us in the needed experiments.

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